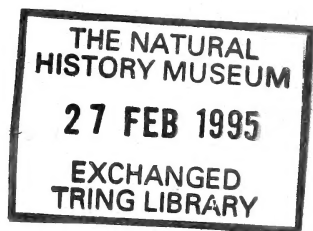


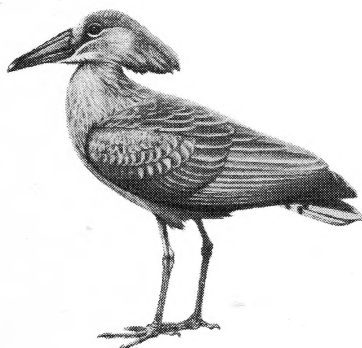


OS. 4018

ISSN 0250-4162



SCOPUS



A publication of the
Ornithological Sub-committee of the
East Africa Natural History Society

Edited by
Graeme Backhurst

Volume 18, No. 1, November 1994

SCOPUS

Cover illustration from a gouache painting by Dr P. A. Clancey

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Authors are asked to follow the conventions used in *Scopus* and to refer to a recent issue for guidance. Metric units should be used. A few examples of conventions are: **dates:** 23 September 1991 [note the order, no comma, not '23rd']; **names of birds:** Cape Rook *Corvus capensis* [no comma, no parentheses, no author's name]; **list of**

Continued inside back cover



Notes on raptor migration in western Tanzania 1995

Craig B. Stanford

The migratory patterns of birds of prey across the African continent are poorly known compared to migrations of raptors in Europe and North America. Although it is well documented that a number of species use routes taking them to and from Europe or North Africa to southern Africa along the East African rift valleys (Brown & Amadon 1968, Britton 1980), details and estimates of numbers are lacking. Additionally, western Tanzania has received less attention from ornithologists and birders than other parts of the country, mainly because most birders have concentrated their attention on the larger game parks in the northern and eastern interior. Bird species diversity for Gombe National Park is at least 230 species (Stanford & Msuya, unpublished). The lack of attention to western Tanzania is unfortunate, since a number of central African species apparently occur only on the eastern shore of Lake Tanganyika (Short *et al.* 1990). The two national parks located on the shore of the lake, Gombe National Park and Mahale Mountains National Park, are known more for their non-human primate fauna than for birds, yet both parks lie along the western rift migration route used by a number of raptor species and may provide new information on migratory patterns for this part of East Africa.

This paper reports on observations of the passage of birds of prey along the eastern shore of Lake Tanganyika, primarily in and around Gombe National Park. These observations were made as a supplement to a study of the predation ecology of Red Colobus Monkeys *Procolobus badius tephrosceles* and Chimpanzees *Pan troglodytes schweinfurthii* at Gombe (Stanford *et al.* unpublished); raptor sightings were documented because, other than Chimpanzees, large raptors may be the most important predators on immature red colobus at Gombe. Additionally, observations of migratory flights were made during a visit to the Mahale Mountains, 160 km south of Gombe along the lakeshore.

Study area and methods

The study site is a 45-km² national park bordering Lake Tanganyika, composed of steep valleys containing riverine woodland, with *miombo* woodland higher on the valley slopes. Gombe National Park and its fauna have been described in detail elsewhere (Goodall 1986). During 1991 and 1992, regular censuses were conducted during the raptor migration season as birds passed southward along the western rift that forms the eastern border of the national park (elevation 1750 m). Sightings were made on an *ad libitum* basis in the course of nearly every day in the field between 1 September and 15 November. Two main points in the park were used for watching the skies for raptors: the "Peak," a point of land near the lake edge on a ridge separating Kakombe and Kasakela valleys from where a panoramic view afforded excellent close

sightings of raptors and other birds passing along the lake, the shore area and the lower valley. Additionally, several times each year day-long censuses were made from the rift itself, at approximately 1600 m elevation at the head of Kakombe valley. The number and diversity of species sighted varied between these sites depending on daily wind conditions. In addition, in the course of wildlife research in the forest at Gombe, records were kept of sightings of all raptors as part of a field study of the ecology of Red Colobus Monkeys and their major predators. Although field identification of species was not always possible, daily observation throughout the study periods make it likely that the data on raptor flights were representative of the relative abundance of different species at different points in the season.

Results and Discussion

On a given day, a number of large and small raptor species were sighted; this paper is concerned mainly with those that appeared to be passing through on migration. Strong easterly winds invariably produced the largest flights, and appeared to concentrate migrants along the lakeshore, while on calm days raptors appeared more widely dispersed and were typically seen at much greater heights over the higher sections of the rift and beyond to the east. Of the migrants, there were four main species; Wahlberg's Eagle *Hieraaetus wahlbergi*, Tawny Eagle *Aquila rapax*, Common Buzzard *Buteo buteo*, and Northern Hobby *Falco subbuteo*. Other raptors, such as Martial Eagle *Hieraaetus bellicosus*, and Crowned Eagle *Spizaetus coronatus*, were resident in the park and were frequently observed; these species, however, are not known to be migrants (Britton 1980). Only the four species above were rarely sighted outside the migration but were common during these months. A full list of raptor species known to occur in the park is included in Table 1 (taken from Stanford and Msuya, unpublished). Black Kites of two subspecies, *Milvus migrans migrans* and *M. m. parasitus*, were present, although *parasitus* occurred predominantly in September and so may have been a migrant.

Table 1. *Raptors recorded in Gombe National Park*
Nomenclature follows Short *et al.* 1990

Palm-nut Vulture	<i>Gypohierax angolensis</i>
African White-backed Vulture	<i>Gyps africanus</i>
Augur Buzzard	<i>Buteo augur</i>
Common Buzzard	<i>B. buteo</i>
Black Kite	<i>Milvus migrans migrans</i>
Black Kite (yellow-billed race)	<i>M. m. parasitus</i>
Gabar Goshawk	<i>Micronisus gabar</i>
Lizard-buzzard	<i>Kaupifalco monogrammicus</i>
African Harrier-hawk	<i>Polyboroides radiatus</i>

Black-shouldered Kite	<i>Elanus caeruleus</i>
Osprey	<i>Pandion haliaetus</i>
Bateleur	<i>Terathopius ecaudatus</i>
Verreaux's Eagle	<i>Aquila verreauxi</i>
Tawny Eagle (includes "Steppe Eagle")	<i>A. rapax/nipalensis</i>
Wahlberg's Eagle	<i>Hieraaetus wahlbergi</i>
African Hawk-eagle	<i>H. spilogaster</i>
Martial Eagle	<i>H. bellicosus</i>
Long-crested Eagle	<i>Spizaetus occipitalis</i>
Crowned Hawk Eagle	<i>S. coronatus</i>
African Fish-eagle	<i>Haliaeetus vocifer</i>
African Little Sparrowhawk	<i>Accipiter minullus</i>
African Goshawk	<i>A. tachiro</i>
Montagu's Harrier	<i>Circus pygargus</i>
Bat-hawk	<i>Machaeeramus alcinus</i>
Northern Hobby	<i>Falco subbuteo</i>
Peregrine (Falcon)	<i>F. peregrinus</i>
Common Kestrel	<i>F. tinnunculus</i>
African Pygmy Falcon	<i>Polihierax semitorquatus</i>

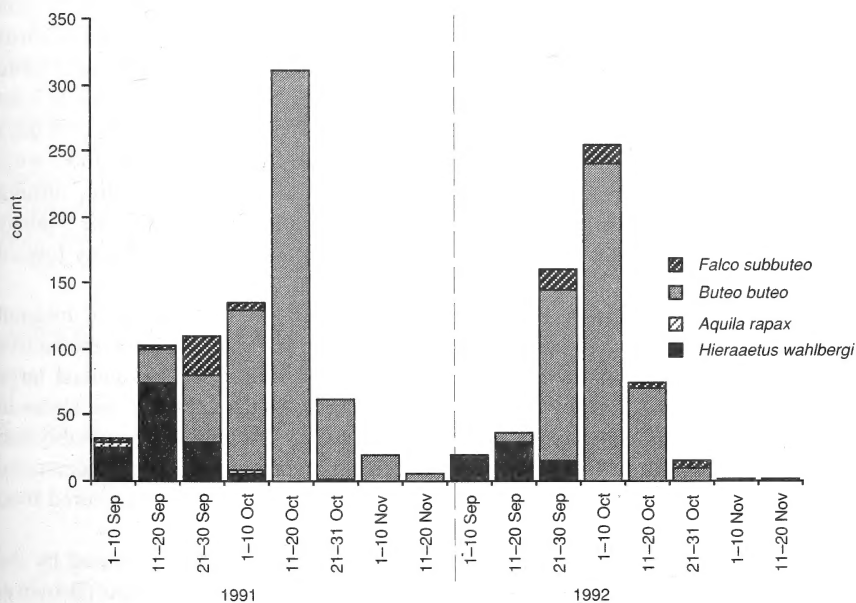


Figure 1. Numbers of four migratory species of raptor passing south through Gombe National Park in 1991 and 1992

Figure 1 shows the monthly variation in occurrence of four migrant raptor species; each bar represents one-third of a month. Common Buzzards composed the majority of migrants sighted. In both 1991 and 1992 their flights were concentrated in late September through mid-October. On days with ideal weather, impressive flights occurred. On both 30 September and 2 October 1992, for example, buzzards passed over Kakombe valley for several hours each day at average rates of more than one bird per minute. A large proportion were in immature plumage. Wahlberg's Eagle was the other frequently observed migrant, though in much smaller numbers than Common Buzzard. Wahlberg's Eagles peaked in numbers in mid-September and were not seen after 1 October in either year. Small numbers of Tawny Eagles were seen, and were suspected to be migrants because they were rarely sighted outside September and October. Northern Hobbies were observed along the lakeshore, mainly at dusk, passing southward singly and in pairs in late September. Individuals of this species also remain in Gombe throughout the northern winter, and are found mainly at higher elevations in *miombo* and over open grassy areas.

At various times during the two sampling periods large flights of other birds appeared also. In early and mid-September, for example, flights of Eurasian Swifts *Apus apus*, passed through Gombe, and in early October flights of Eurasian Bee-eaters *Merops apiaster*, Western House-martins *Delichon urbica*, and Barn Swallows *Hirundo rustica*, were seen daily.

The largest flight of migrant raptors observed during the study period was not observed at Gombe. During a 12-day visit to Mahale Mountains National park, 160 km south of Gombe on the Lake Tanganyika shoreline, large flights of European Buzzards were seen on 21 and 22 October 1991. From a ridge just west of the rift, a flight of more than two birds per minute was seen for approximately 3 h each day, totalling at least 800 buzzards during the sampling period alone. Intermittently heavy rain on both days probably prevented what would have been an even larger flight. All birds sighted were of this species, and the route taken was southward along the lakeshore, turning southeastward and appearing to cross the rift to the south and east of the Mahale research camp at Kasoge. This route, if continued, would take the flights toward northern Zambia.

Factors other than wind conditions also influenced the appearance of migrant raptors. In late October and early November 1991, large flights of the reproductive (alate) stage of a species of termite (probably *Macrotermes* spp.) produced large concentrations of Black Kites and Common Buzzards which captured the alates in large numbers on the wing and circled for hours feasting. These birds presumably had been en route southward over the lake or higher over the rift, but concentrated themselves over a small strip of Gombe in order to exploit this easily captured food source.

The uncertain status of migrant African birds of prey is further confused by the tendency for some species to be both residents and intercontinental migrants (Brown *et al.* 1982, Short *et al.* 1990). It appeared that Black Kites of the nominate subspecies were year-round residents along the Gombe lakeshore, while the yellow-billed race

parasitus occurred only as a migrant. The origin of Common Buzzards passing through Gombe, however, is more likely to be Europe and northern Asia rather than Palaearctic (northern) Africa (Brown *et al.* 1982). Western Tanzanian resident and migrant avifauna have been largely ignored, even though Gombe and Mahale lie along a major migration route. Further data from this region may help to resolve the status and flight paths of migrant African raptors.

Acknowledgements

I thank the Tanzania Commission for Science and Technology (UTAFITI), Tanzania National Parks, and the Serengeti Wildlife Research Institute for permission to work at Gombe. Funding was provided by the L.S.B. Leakey Foundation, The Fulbright Foundation and the National Geographic Society. For additional information on raptor sightings in Gombe National Park, I thank Dr D.A. Collins, E. Mpongo, P. Msuya, S. Qolli and W. Wallauer. At Mahale, I am grateful to Dr T. Nishida for his hospitality.

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Birds observed from Kigoma to Kalambo Falls on the eastern side of Lake Tanganyika

A. L. Archer

From 20 September to 15 October 1993 a list of birds seen or heard between Kigoma and Kalambo Falls on the Tanzania–Zambia border was compiled during the course of retracing much of Dr David Livingstone's last journey of 1873. The expedition was conducted through the New Century Conservation Trust of Boothbay Harbor, Maine, USA, a non-profit, environmental and educational organization.

Much of the eastern side of Lake Tanganyika is zoologically little known apart from Gombe and Mahali National Parks, in both the emphasis has been on primate study although a bird list (Stanford 1992) exists for Gombe. Two species previously unrecorded were added to this list. From Kigoma to Kasanga all birds recorded were within 3 km of the lakeshore at a mean altitude of 750 m above sea level. Kalambo Falls lies some 10 km to the east of the lake. Much of the inland vegetation is *Brachystegia* woodland on steep hilly slopes, most of this had been recently burnt through, an annual occurrence.

The list is not comprehensive, and many species will have been missed due to time constraints imposed by having to cover set daily distances, either by boat or, later, on foot. The last few days of the journey coincided with the arrival of large numbers of migratory raptors, Eurasian Bee-eaters *Merops apiaster* and Eurasian Swallows *Hirundo rustica* together with a few Sand Martins *Riparia riparia* and Palaearctic waders and warblers; a single Spotted Flycatcher *Muscicapa striata* was also seen.

Table 1. *Gazetteer of place names in order of mention, with dates (all 1993) and codes used in the following annotated list*

Date	code	place	co-ordinates
19–20 Sep	A =	Kigoma	4°52S, 29°37E
21 Sep	B =	Luiche River delta	4°57S, 29°41E
22 Sep	C =	Kabogo	5°27S, 29°45E
22 Sep	D =	Bulimba	5°53S, 29°57E
22 Sep	E =	Mgambo	5°58S, 29°52E
23/26 Sep	F =	Mahali NP camp site	6°26S, 29°43E
26 Sep	G =	Kalya	6°28S, 30°00E
27 Sep	H =	Kangwena	6°37S, 30°18E
27 Sep	J =	Ikola	6°44S, 30°24E
27 Sep	K =	Karema	6°49S, 30°26E
28 Sep	L =	Kabwe (beach to NE)	6°59S, 30°34E
28 Sep	M =	Musalaba Point	—
28–29 Sep	N =	Kipili	7°34S, 30°56E
30 Sep	O =	Kipamba Bay	7°38S, 30°40E
1 Oct	P =	Ninde Bay	7°41S, 30°44E

Date	code	place	co-ordinates
2 Oct	Q =	Lupole Rocks	7°44S, 30°45E
3 Oct	R =	Msamba	—
3 Oct	S =	Kapindi	—
3 Oct	T =	Liapindi	—
4 Oct	U =	Kisumbi	—
5–6 Oct	V =	Izinga (Vumba Bay)	8°01S, 30°55E
7 Oct	W =	Itanga	—
7 Oct	X =	Kala	8°08S, 30°56E
7 Oct	Y =	Kilimbo (Kawumba Bay)	8°15S, 30°59E
9 Oct	Z =	Kibanga (Lwazi River)	—
9–10 Oct	AA =	Kalepo	8°20S, 31°03E
11 Oct	BB =	Kisala/Samanzi lagoon	—
11 Oct	CC =	Molwe	—
12 Oct	DD =	Muzi	8°26S, 31°09E
12 Oct	EE =	Kasanga	8°28S, 31°09E
13–15 Oct	KF =	Kalambo Falls	8°36S, 31°14E

Birds observed between Kigoma to Kalambo Falls

h = heard, not seen; AK = A. Kiribai; DLW = D. L. Wilson
the number preceding the name is from Britton (1980)

- 17 *Phalacrocorax africanus* Long-tailed Cormorant B, G c. 10, H, N, S, V, Y.
- 18 *P. carbo* Greater Cormorant A: 1, H: 8, M: 6.
- 19 *Anhinga rufa* Darter D.
- 25 *Ardea cinerea* Grey Heron F to G: 1, G: 5 on rocks.
- 26 *A. goliath* Goliath Heron B, Y.
- 28 *A. purpurea* Purple Heron Y, Z.
- 30 *Ardeola ralloides* Squacco Heron W, Y.
- 32 *Bubulcus ibis* Cattle Egret A, M.
- 33 *Butorides striatus* Green-backed Heron C, N, S.
- 36 *Egretta garzetta* Little Egret N.
- 42 *Scopus umbretta* Hamerkop G: 1, V.
- 49 *Leptoptilos crumeniferus* Marabou J: 1, KF: 1.
- 79 *Plectropterus gambensis* Spur-winged Goose J: c. 50, Y.
- 84 *Gypohierax angolensis* Palm-nut Vulture B, D, F, J, N, U, X, Y, Z, CC, KF.
- 87 *Neophron monachus* Hooded Vulture E: 8 on lake shore.
- 95 *Circus ranivorus* African Marsh Harrier U.
- 96 *Polyboroides radiatus* Harrier Hawk F, X to Y, AA.
- 98 *Circus cinereus* Brown Snake Eagle Q to R.
- 101 *Terathopius ecaudatus* Bateleur O, Q to R, X to Y.
- 109 *Accipiter ovampensis* Ovampo Sparrowhawk W.
- 122 *Buteo buteo* Common Buzzard Migrating raptors were first observed flying south on 12 October when a flock of c. 30 flew high overhead. From 12–15 October (when I left Kalambo Falls) many hundreds were seen, twice in flocks of 250–300. The majority were *B. b. vulpinus*, however, at least two other species

- occurred but being high-flying, were not identified. The eastern side of Lake Tanganyika is evidently a well used southern migratory route for not only raptors but Eurasian Bee-eaters, Eurasian Swallows, Sand Martins and some warblers (see Stanford 1994).
- 129 *Kaupifalco monogrammicus* **Lizard Buzzard** DD: 1 in *Brachystegia* woodland.
 - 137 *Haliaeetus vocifer* **Fish Eagle** C, F to G: 2 including one on nest, K: pair, N, O, S, AA.
 - 138 *Milvus migrans* **Black Kite** The yellow-billed race *M. m. parasitus* was seen almost daily and was present at most villages. A flock of c. 40 seen between F and G, one with a grey-black bill, could have been of the migrant nominate race.
 - 142 *Elanus caeruleus* **Black-shouldered Kite** X to Y, Y, DD, EE.
 - 144 *Pandion haliaetus* **Osprey** G: single on offshore rock.
 - 153 *Falco dickinsoni* **Dickinson's Kestrel** Q to R.
 - 158 *F. peregrinus* **Peregrine Falcon** DD: 3 flying over cliffs, KF: 1.
 - 171 *Fringolotus hildebrandti* **Hildebrandt's Francolin** Q.
 - 188 *Guttera edouardi* **Crested Guineafowl** F.
 - 190 *Numida meleagris* **Helmeted Guineafowl** Q, Z: c. 30.
 - 201 *Limnecorax flavirostra* **Black Crake** S: h, Y: h.
 - 202 *Porphyrio alleni* **Allen's Gallinule** C, F. Both sightings of single birds seen in poor light in flight at dawn and dusk respectively, the former landing in a hillside thicket above the lake shore.
 - 225 *Actophilornis africanus* **Jacana** Y, BB.
 - 252 *Actitis hypoleucos* **Common Sandpiper** D, CC.
 - 257 *Tringa nebularia* **Greenshank** G: 1.
 - 290 *Burhinus vermiculatus* **Water Thicknee** F, G: 1.
 - 298 *Glareola nuchalis* **White-collared Pratincole** A: 2 on offshore rock north end of Kigoma Bay and a second sighting of a single bird on a rock 100 m offshore at 6°25'S, 29°51'E. These are believed to be the first records from Lake Tanganyika (Britton 1980).
 - 306 *Larus cirrocephalus* **Grey-headed Gull** S, U: c. 10, X, X to Y, Y.
 - 346 *Streptopelia capicola* **Ring-necked Dove** N, O, Q, X.
 - 350 *S. semitorquata* **Red-eyed Dove** A, G, N, O, X, BB.
 - 356 *Turtur chalcospilos* **Emerald-spotted Wood Dove** Q.
 - 357 *T. tympanistria* **Tambourine Dove** C, KF.
 - 358 *Treron australis* **Green Pigeon** P, Y.
 - 363 *Agapornis pullaria* **Red-headed Lovebird** F: pair seen and described by DLW.
 - 367 *Poicephalus meyeri* **Brown Parrot** KF: pair.
 - 382 *Tauraco livingstonii* **Livingstone's Turaco** KF: pair seen by DLW and AK.
 - 389 *Chrysococcyx cupreus* **Emerald Cuckoo** KF.
 - 391 *C. klaas* **Klaas' Cuckoo** F.
 - 396 *Cuculus clamosus* **Black Cuckoo** W: not previously recorded in Tanzania west of 35°E (Britton 1980).
 - 399 *C. solitarius* **Red-chested Cuckoo** W: h, KF.
 - 406 *Centropus superciliosus* **White-browed Coucal** L, O, Y: h, BB.
 - 441 *Macrodipteryx vexillarius* **Pennant-winged Nightjar** F.
 - 442 *Apus aequatorialis* **Mottled Swift** KF: a flock of c. 100 circled above the Kalambo Falls gorge together with several unidentified *Apus* sp. with white rumps.

- 452 *Cypsiurus parvus* Palm Swift P, R, U, BB.
 459 *Colius striatus* Speckled Mousebird G.
 462 *Apaloderma narina* Narina's Trogon F.
 464 *Ceryle maxima* Giant Kingfisher A, C, F to G: seen every few kilometres on rocky shore, G: 1, H, J.
 465 *C. rudis* Pied Kingfisher A, D, D to G: several, G, M, O, V.
 466 *Alcedo cristata* Malachite Kingfisher G: 1.
 469 *A. semitorquata* Half-collared Kingfisher KF.
 470 *Halcyon albiventris* Brown-hooded Kingfisher KF.
 473 *H. leucocephala* Chestnut-bellied Kingfisher Q.
 478 *Ispidina picta* Pygmy Kingfisher F.
 479 *Merops albicollis* White-throated Bee-eater F, G.
 480 *M. apiaster* Eurasian Bee-eater O to KF: first seen 29 September, thereafter large numbers flying south daily.
 491 *M. pusillus* Little Bee-eater S, X, KF.
 496 *Coracias caudata* Lilac-breasted Roller O.
 500 *Eurystomus glaucurus* Broad-billed Roller P, V.
 508 *Phoeniculus purpureus* Green Wood Hoopoe N: pair, Q to R.
 510 *Bycanistes bucinator* Trumpeter Hornbill F: c. 15 feeding in forest on *Ficus* sp fruit; S.
 515 *Tockus alboterminatus* Crowned Hornbill C: h, H: pair, T: h, V, X to Y, BB, KF.
 543 *Lybius minor* Black-backed Barbet K, L: 1.
 546 *L. torquatus* Black-collared Barbet O, X, KF.
 579 *Campethera bennettii* Bennett's Woodpecker KF.
 624 *Hirundo abyssinica* Striped Swallow P, Q, R, U.
 632 *H. fuligula* African Rock Martin Q, CC, KF.
 634 *H. rustica* Eurasian Swallow First seen at Kipili on 28 September—small numbers flying south. These increased daily with many hundreds being observed flying parallel to the lake shore heading south. Migration continued for two weeks up to Kasanga and others were noted inland at Kalambo Falls on 14–15 October.
 637 *H. smithii* Wire-tailed Swallow W, X to Y.
 639 *Psalidoprocne albiceps* White-headed Rough-wing KF.
 643 *Riparia riparia* Sand Martin X to Y: several flying south; BB: 1.
 644 *Dicrurus adsimilis* Drongo O, Q to R.
 649 *Oriolus larvatus* Black-headed Oriole Q, R, T: h, V.
 653 *Corvus albicollis* White-necked Raven E: 10 in Mgambo village, Q to R, EE: on beach with *C. albus*, KF.
 654 *C. albus* Pied Crow B, L, N, P, U, V, X to Y, EE.
 681 *Turdoides jardineii* Arrow-marked Babbler N: small flock, S.
 705 *Andropadus virens* Little Greenbul F.
 710 *Chlorocichla flaviventris* Yellow-bellied Greenbul Q, V, W, BB, CC, KF.
 716 *Nicator chloris* Nicator F.
 730 *Phyllastrephus terrestris* Brownbul (yellow/white eye not noted) KF.
 732 *Pycnonotus barbatus* Common Bulbul F, H, N, P, W, X, BB, CC, KF.
 738 *Cercomela familiaris* Red-tailed Chat CC.
 748 *Cichladusa guttata* Spotted Morning Thrush A.

- 751 *Cossypha heuglini* White-browed Robin Chat Q, KF.
 752 *C. natalensis* Red-capped Robin Chat F.
 791 *Thamnolaea arnotti* White-headed Black Chat X to Y, KF.
 792 *T. cinnamomeiventris* Cliff Chat a pair at Karembe Hill south of C; O: pair, Q: pair.
 818 *Apalis flava* Yellow-breasted Apalis BB.
 837 *Camaroptera brachyura* Grey-backed Camaroptera V.
 859 *Cisticola fulvicapilla* Tabora Cisticola X to Y, Y, CC.
 883 *Heliolais erythroptera* Red-winged Warbler KF.
 908 *Phylloscopus trochilus* Willow Warbler V: 4, BB, KF: c. 15.
 945 *Muscicapa striata* Spotted Flycatcher F.
 961 *Platysteira peltata* Black-throated Wattle-eye KF.
 968 *Terpsiphone viridis* Paradise Flycatcher F, O, V, X to Y.
 991 *Motacilla aguimp* African Pied Wagtail recorded at nearly every village and beach, normally very tame; KF.
 996 *M. flava* Yellow Wagtail Y: 2.
 999 *Dryoscopus cubla* Black-headed Puffback V, KF.
 1004 *Laniarius ferrugineus* Tropical Boubou G, P, KF.
 1019 *Malaconotus sulfureopectus* Sulphur-breasted Bush Shrike F, Y, KF.
 1022 *Tchagra australis* Brown-headed Tchagra Q, Y.
 1025 *T. senegala* Black-headed Tchagra O.
 1029 *Lanius collaris* Fiscal P, S.
 1045 *Prionops retzii* Retz's Helmet Shrike Q to R.
 1048 *Cinnyricinclus leucogaster* Violet-backed Starling F: c. 20 feeding in *Ficus* sp. fruit; O, Q, W, X to Y, KF.
 1064 *Onychognathus morio* Red-winged Starling F to G: pair on rocky hillside, G, Q to R, KF.
 1080 *Anthreptes collaris* Collared Sunbird O, W, CC, KF.
 1091 *Nectarinia amethystina* Amethyst Sunbird Q, W.
 1094 *N. chloropygia* Olive-bellied Sunbird F.
 1112 *N. olivacea* Olive Sunbird F.
 1122 *N. senegalensis* Scarlet-chested Sunbird N, O, X to Y.
 1128 *N. venusta* Variable Sunbird KF.
 1141 *Euplectes capensis* Yellow Bishop X.
 1146 *E. hordeaceus* Black-winged Red Bishop S: c. 40 non-breeding; KF.
 1165 *Ploceus cucullatus* Black-headed Weaver P, Y, BB.
 1175 *P. nigerrimus* Vieillot's Black Weaver F.
 1177 *P. ocularis* Spectacled Weaver D, Y, KF.
 1189 *P. xanthops* Holub's Golden Weaver Q to R.
 1206 *Passer griseus* Grey-headed Sparrow A.
 1219 *Amandava subflava* Zebra Waxbill T.
 1233 *Estrilda rhodopyga* Crimson-rumped Waxbill T.
 1235 *Hypargos niveoguttatus* Peters' Twinspot CC.
 1239 *Lagonosticta rubricata* African Firefinch O, X, Y.
 1241 *L. senegala* Red-billed Firefinch T, DD.
 1242 *Mandingoa nitidula* Green-backed Twinspot F.
 1256 *Pytilia melba* Green-winged Pytilia O.

- 1266 *Emberiza tahapisi* Cinnamon-breasted Rock Bunting KF.
1290 *Serinus mozambicus* Yellow-fronted Canary W, X.

Acknowledgements

I am grateful to both Charles T. Haskell and Elizabeth McKnight of New Century Conservation Trust for their enthusiastic assistance at all times. Bird observations were also made by Dr David Livingstone Wilson, great-grandson of the explorer, and by Abadiva Kiribai. The Tanzanian Government was extremely helpful in every way and in particular I would like to thank Mr Zahoro Kimwaga of the Ministry of Tourism and S/Sgt Danford Aggey and Sgt Akida who accompanied the expedition throughout at different stages.

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Scopus 18: 6-11, November 1994

Received 4 December 1993

Appendix 1

Gombe National Park

Gombe National Park (4°53S, 29°37E) lies to the north of Kigoma and is only mentioned here as two previously unrecorded birds were observed in the park on 9 September 1993.

***Oriolus percivali* Montane Oriole** A single bird in forest canopy was seen well and the white tips to the wing coverts were clearly seen. Known from the Mahali Mountains further south (Mackworth-Praed & Grant 1955).

***Ploceus superciliosus* Compact Weaver** Four or five of these weavers were members of a mixed bird party in forest. All were in eclipse plumage where the diagnostic broad pale yellow eyestripe and heavy pinkish-horn bill were seen.

Decreases in the waterbird populations at Lake Turkana, Kenya

Luca Borghesio and Luca Biddau

Lake Turkana has long been considered one of the most important wetlands in East Africa, particularly for migrant species (e.g., Fry *et al.* 1972). In 1980, Pearson & Stevenson reckoned its shores to hold more wintering waders than all the other Kenyan Rift Valley lakes. Yet, until recent times, the lake received limited attention from ornithologists, the main causes for this being its enormous size and harsh climate. Renewed interest has resulted in a number of censuses and other research work being carried out in the area since 1986, producing the first numeric estimates of overall waterbird numbers.

From December to March the lake is now considered to hold a population of about 200 000 birds—at least half of them are waders (Schekkerman & van Wetten 1987, Pearson *et al.* 1992a, b, Fasola *et al.* 1993a). These numbers decrease by almost 80 per cent in July, when the Palaearctic migrants leave (Fasola *et al.* in press). Some 25 waterbird species could be represented at Turkana by more than 1 per cent of their East African populations, and thus meet one of the Ramsar Convention's criteria for identifying internationally important wetlands (Fasola *et al.* 1993a, Pearson *et al.* 1992b).

Although the order of magnitude of the lake's avifauna is now quite well known, very little information is available on its fluctuations in the long term. Comparisons between years are difficult because the stretches of shore chosen for different surveys were largely non-coincident and because of the differences in census techniques (i.e., ground or aerial).

In this paper we present the results of a census carried out in February and March 1993 along a 165-km-long section of lake shore previously surveyed in 1987 by Schekkerman and van Wetten. The two data sets are compared, and with those of a 1992 census (Fasola *et al.* 1992a).

Survey area and methods

The survey area was described in detail by Hopson (1982) and by Schekkerman & van Wetten (1987). Figure 1 shows the area where the censuses were carried out and the localities cited in the text.

The severe drought that had struck the region for over three years suddenly came to an end at the beginning of 1993. Rain was met with on 25 February, 8 and 15 March. Local people told us that more had fallen before our arrival. The good rains were probably one of the reasons for the very low numbers of birds recorded in the Loyengalani–El Molo area, as here the shores were covered by large amounts of debris brought down by temporary rivers.

The census was done between 22 February and 15 March 1993 from Loyengalani (2°43N, 36°41E) to Allia Bay (3°45N, 36°17E). The counting technique was the same as adopted by Schekkerman and van Wetten (1987). The difference of about 15 days between the dates of the two surveys had no negative influence on the comparisons because no migration-related changes or movements in the avifauna were noticed during the fieldwork. Nomenclature follows Howard & Moore (1991).

Results

The results of the counts and the differences between 1993 and 1987 are presented in Table 1. The avifauna of the lake seems to have decreased, both in overall numbers and in diversity. A total of 29 810 individuals of 73 species was recorded during our stay, that is, respectively 29 330 and ten fewer species than in the previous survey. Most species had decreased markedly, while only a few had increased; these were mainly resident or intra-African migrants, such as Spur-winged Plover *Vanellus spinosus* (resident), Common Pratincole *Glareola pratincola* (partial resident), Grey-headed Gull *Larus cirrocephalus* (resident) and Saunders' Little Tern *Sterna saundersi*, whose status is not clear but is believed to have an isolated resident population at Turkana (Lewis & Pomeroy 1989). Figure 2 shows variations in different taxa during the six-year period: Pelecaniformes lowered by 53 per cent, Ciconiiformes by 48 per cent, Scolopacidae by 58 per cent, and Anatidae by 83 per cent: in the last, the decline of the Palaearctic species was almost 99 per cent, as only 27 individuals of Palaearctic origin were observed against 2208 in 1987; Charadriidae exhibited a relatively limited decline of about 17 per cent. Laridae decreased by a small amount (6 per cent), but here Palaearctic species showed a strong reduction (45 per cent) while Afrotropical ones increased substantially (32 per cent).

The numeric decrease observed in 1993 was particularly strong where the highest populations were located, that is, the Loyengalani–El Molo area and Allia Bay, where long stretches of muddy shore are found. The long rocky and sandy sections, from Sandy Bay to Moiti, lost comparatively fewer birds (Figure 3). Maximum densities of 400–450 birds/km were recorded in muddy habitats, against those as high as 1237 birds km⁻¹ in 1987.

On the whole, in 1993, the lake failed to provide observations of species rarely recorded inland, in contrast to previous surveys. The only somewhat unusual record was of a Red-necked Phalarope *Phalaropus lobatus* at El Molo Bay on 28 February. This is a mainly marine species that occasionally winters inland (Dowsett 1980).

Comparison with the 1992 census (Fasola *et al.* 1993a) is difficult as these estimates were obtained by an aerial census; only a relatively short stretch of shore, 56 km long, was counted from the ground (Biddau & Borghesio unpublished data) and was entirely comprised within the present survey. Referring to it (Figure 4), decreases are again noticeable in most taxa, the largest being those of Scolopacidae (down 59 per cent) and Anatidae (down 82 per cent). Laridae and Pelecaniformes increased, although very slightly (up 5 per cent and 8 per cent, respectively). An overall total of 9929 birds of 57 species was recorded in 1993 against 18 993 of 63 species in 1992.

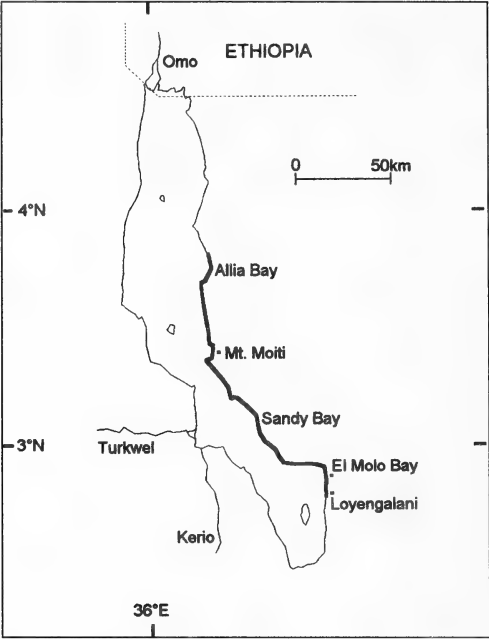


Figure 1. Map of Lake Turkana showing the localities mentioned in the text.
The bold line indicates the census area

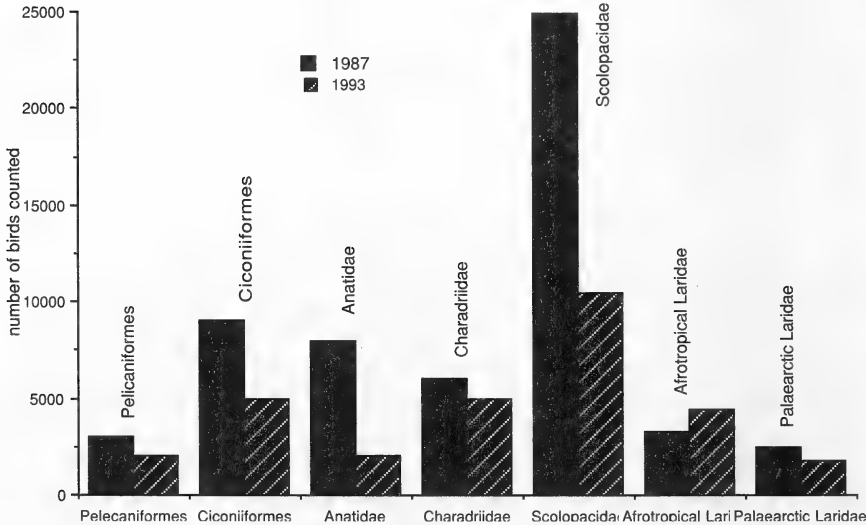


Figure 2. Numbers of birds counted at Lake Turkana in 1987 and 1993

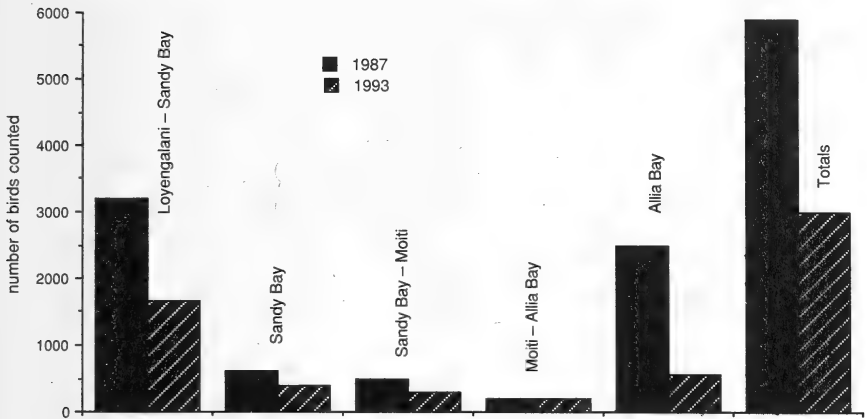


Figure 3. Numbers of water birds counted at Lake Turkana in 1987 and 1993

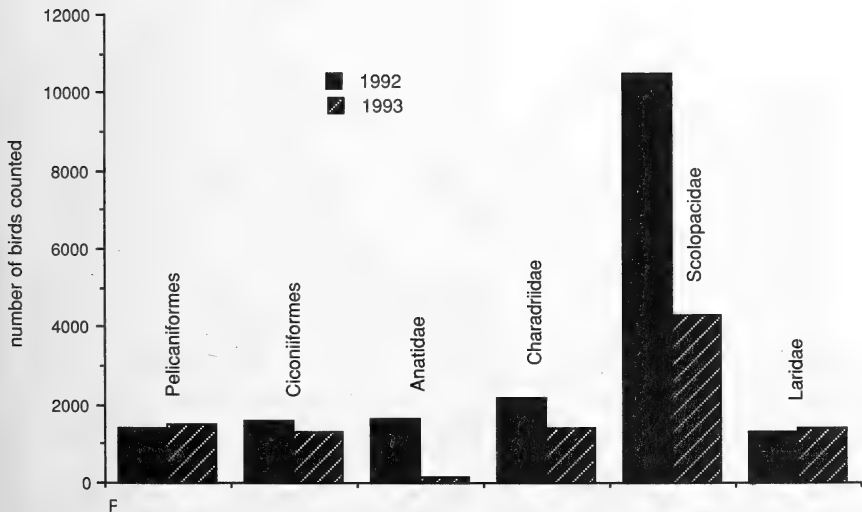


Figure 4. Waterbirds counted along 56-km of shore at Lake Turkana in 1992 and 1993

Table 1. *Birds counted at Lake Turkana in February–March 1993, and differences between 1993 and 1987 counts. R = Resident, P = partial migrant, I = migrant*

Species	1993 counts	Difference: 1993–1987	Status
<i>Tachybaptus ruficollis</i>	83	-73	R
<i>Pelecanus onocrotalus</i>	196	-369	P
<i>Pelecanus rufescens</i>	172	-766	P
<i>Phalacrocorax carbo</i>	387	-558	R
<i>Phalacrocorax africanus</i>	879	-142	R
<i>Ardea cinerea</i>	158	-150	R
<i>Ardea melanocephala</i>	1	-4	R
<i>Ardea goliath</i>	20	-22	R
<i>Ardea purpurea</i>	6	5	P
<i>Egretta alba</i>	45	-290	P
<i>Egretta ardesiaca</i>	11	0	P
<i>Egretta garzetta</i>	358	-81	P
<i>Egretta g. schistacea</i>	3	2	P
<i>Bubulcus ibis</i>	145	-36	R
<i>Ardeola ralloides</i>	20	-45	P
<i>Butorides striatus</i>	2	0	R
<i>Nycticorax nycticorax</i>	25	3	P
<i>Mycteria ibis</i>	109	-288	R
<i>Ciconia abdimii</i>	2	2	I
<i>Ciconia ciconia</i>	2	2	I
<i>Leptoptilos crumeniferus</i>	6	-8	R
<i>Threskiornis aethiopica</i>	142	14	R
<i>Plegadis falcinellus</i>	96	-268	P
<i>Platalea alba</i>	171	-410	R
<i>Phoenicopterus ruber</i>	553	-1192	P
<i>Phoeniconaias minor</i>	2929	-1703	R
<i>Dendrocygna bicolor</i>	8	-2316	P
<i>Dendrocygna viduata</i>	181	-1616	P
<i>Alopochen aegyptiacus</i>	1084	-657	R
<i>Plectropterus gambensis</i>	111	111	P
<i>Sarkidiornis melanotos</i>	4	-12	P
<i>Anas penelope</i>	8	-498	I
<i>Anas acuta</i>	16	-589	I
<i>Anas hottentota</i>	18	-49	P
<i>Anas querquedula</i>	2	-174	I
<i>Anas clypeata</i>	1	-919	I
<i>Netta erythrophthalma</i>	1	-60	P

Species	1993 counts	Difference: 1993-1987	Status
<i>Pandion haliaetus</i>	30	-25	I
<i>Haliaeetus vocifer</i>	18	-1	R
<i>Fulica cristata</i>	21	2	P
<i>Rostratula benghalensis</i>	2	0	R
<i>Himantopus himantopus</i>	165	-788	P
<i>Recurvirostra avosetta</i>	145	68	I
<i>Burhinus senegalensis</i>	161	-137	R
<i>Glareola pratincola</i>	698	370	P
<i>Vanellus spinosus</i>	1996	719	R
<i>Charadrius hiaticula</i>	1633	-264	I
<i>Charadrius pecuarius</i>	847	-899	R
<i>Charadrius tricollaris</i>	1	-6	R
<i>Charadrius asiaticus</i>	171	-399	I
<i>Limosa limosa</i>	305	-4279	I
<i>Numenius arquata</i>	4	-11	I
<i>Tringa totanus</i>	4	-1	I
<i>Tringa stagnatilis</i>	454	-294	I
<i>Tringa nebularia</i>	456	-85	I
<i>Tringa glareola</i>	93	-211	I
<i>Xenus cinereus</i>	25	24	I
<i>Actitis hypoleucos</i>	350	-243	I
<i>Arenaria interpres</i>	35	-19	I
<i>Phalaropus lobatus</i>	1	1	I
<i>Calidris minuta</i>	8012	-8731	I
<i>Calidris ferruginea</i>	476	-309	I
<i>Philomachus pugnax</i>	280	-233	I
<i>Larus fuscus</i>	217	-21	I
<i>Larus cirrocephalus</i>	1930	147	R
<i>Larus ridibundus</i>	271	-268	I
<i>Chlidonias hybrida</i>	37	-574	I
<i>Chlidonias leucoptera</i>	914	-218	I
<i>Gelochelidon nilotica</i>	55	-121	I
<i>Hydroprogne caspia</i>	33	-13	I
<i>Sterna saundersi</i>	1430	1115	unclear
<i>Rynchops flavirostris</i>	559	-317	R
<i>Ceryle rudis</i>	26	19	R
Total	29810	-29330	

Discussion

The data collected at Lake Turkana are well in accordance with the results of the 1993 winter census in the southern Kenyan Rift Valley lakes (Bennun 1993), and all of them show substantial decreases in the Kenyan waterbird populations. As similar downward trends were not generally reported elsewhere in Africa (Taylor 1993), the decreases were probably caused by local environmental changes. The heavy rains that fell on the lake, and on all Kenya, in the first part of the year had surely some negative effects on waterbirds in 1993, but Fasola *et al.* (1993a) reported that at Turkana by January 1992, when the region was under a severe drought, the numbers of some taxa (mainly Pelecaniformes, Ciconiiformes and Anatidae) were already lower than previously. Only variations in Scolopacidae and Charadriidae can therefore be related to the 1993 weather. The decline of Turkana's avifauna can thus be traced over a period of at least two years, and it appears to have affected the larger, mainly fish-eating, species before the waders. The causes for it are not clear, but possible candidates are the increase of fishing activities and the lowering of the lake level, which in turn could have modified the water chemistry and reduced important bird habitats, both in extent and in productivity.

A few species, all of them resident or partly resident, despite general trends, showed substantial increase in numbers. It seems that they profited from the reduced competition by Palaearctic immigrants. This is in partial contradiction with previous studies (Duffy *et al.* 1981, Fasola *et al.* 1993b), that found little evidence of competition between tropical and immigrant waterbirds on the wintering grounds.

More research is needed at Turkana in future years in order to evaluate waterbird populations and the factors contributing to their variation more accurately. It is to be hoped that the disturbingly low numbers recorded in 1993 will soon regain normal levels. However, even if a 50 per cent decrease is assumed, the lake could still hold about 100 000 waterbirds during winter. Moreover, the 165 km of eastern shore censused in 1993, which makes up no more than 25 per cent of the lake, held well over 1 per cent of the estimated total for the Arabian–East African flyway (Perennou 1992) for Caspian Plover *Charadrius asiaticus*, Common Sandpiper *Actitis hypoleucos*, Marsh Sandpiper *Tringa stagnatilis*, Greenshank *Tringa nebularia* and Little Stint *Calidris minuta*.

Acknowledgements

We are grateful to Dr Leon Bennun, of the National Museums of Kenya, to Mr Joe Kioko, the Deputy Director of Kenya Wildlife Service, to Mrs Grazia Isoardi, who shared the long walk in the desert, to the Warden and staff of Sibiloi National Park in Allia Bay and finally to Joseph and William, our guides. Without the help of all these people the work could never have been accomplished.

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Palaeartic migrant waterbirds overlap in habitat use with residents at Lake Turkana, Kenya

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It is still uncertain whether the migrant birds that seasonally crowd African communities, use the same resources of, and compete with their analogue residents. Along a 56-km sector of the southeastern shores of Lake Turkana, northwestern Kenya, waterbird communities are exposed to conditions which may potentially provide a competitive context: in February, the densities of the resident and partial migrant waterbirds are similar to the July figures, while the migrants—mainly species capturing small invertebrate prey—are 20 times more abundant. The availability of small invertebrate prey in mud remains constant from February to July. Migrant birds overlap greatly in foraging habitat with residents. However, other results suggest that competition does not occur. The selection of specific foraging habitats seems due to physical constraints for most species. No species exhibited habitat shifts between February and July despite the densities of possible competitors having greatly changed. An exception is the Lesser Flamingo whose habitat shift cannot be attributed to competition. The rate of inter-species aggressions was very low. We conclude that at Lake Turkana, the arrival of Palaeartic migrant and partial migrant waterbirds does not induce competition with the residents, despite the strong increase in density, particularly of waders and of birds capturing small invertebrate prey.

Resource use within an assemblage of similar species may be constrained by competition between heterospecifics. Cautionary views have been expressed about the pervasiveness of competition. The partial segregation that is usually observed within animal assemblages may be due to factors other than competition, including intrinsic species preferences and opportunistic, non-interactive resource use (Connell 1980, Wiens 1989). Despite these cautions, some reviews of the available information showed that competition is pervasive in the assemblages of similar species, and is more pronounced in predators, large-sized organisms, and freshwater habitats (Schoener 1983, Connell 1983, Gurevitch 1992).

Bird communities in sub-Saharan Africa become somewhat crowded when Palaeartic migrant birds join the residents. One major but still unanswered question is whether the migrants compete with and use the same resources as their analogue African residents (Moreau 1972, Fry 1992). General observations and circumstantial evidence suggested that competition is much less than would have been expected (Moreau 1967, Morel 1973, Hogg *et al.* 1984). However, few quantitative studies have been conducted in tropical Africa on seasonal bird communities, on their resource use or on the possible competitive effects. The few studies (on passerines) showed that migrants are mainly insectivores, exploiting temporarily superabundant resources; that migrants exhibit infrequent aggressive interactions with residents; and that few cases of niche shifts have been observed in relation to the changes in migrant density and to the possible competitive pressure (Lack 1983, 1987, Rabøl 1987, Leisler 1992).

For waterbirds, no detailed community studies have been conducted in central Africa. Abundant data on waterbird populations have recently been collected (Perennou 1991), but only general descriptions of waterbird distribution within biotopes are available (for East Africa by Hogg *et al.* 1984, Brengballe *et al.* 1990).

The aim of our study was to compare the waterbird communities during the seasonal periods of peak and of low presence of Palaearctic migrants along a representative sector of shoreline at Lake Turkana. We describe the changes in community structure, analyse the use of foraging habitat by Palaearctic migrant, partial migrant, and resident waterbirds, and seek indications of possible competitive interactions between residents and migrants.

Study area and methods

We surveyed a 56-km sector of the southeastern shore of Lake Turkana, which is the largest of the Kenyan Rift Valley lakes. This shore sector stretches from 13 km south of Loyengalani to Soiti (2°41'–3°02'N, 36°26'–36°40'E). The shore has major representative habitat types of Lake Turkana in relatively similar proportions. It has 13.0 km of mudflats, 15.7 km of sandy shores, 14.3 km of pebbles and 13.0 km of rocky shores. However, the large reedbeds and mudflats of the Omo Delta at the northern side are under-represented in our sector. Two surveys were conducted on this shore sector, one from 25 January to 22 February 1992 prior to the breeding season of residents and immediately prior to the beginning of the northward movement of Palaearctic migrants, and the second survey from 8 to 14 July 1993 after the residents' breeding season and when migrant presence is minimal (Brown *et al.* 1982). The species, their scientific names and their migrant or resident status are listed in Table 1.

During morning surveys we covered the entire shore sector and we censused all the waterbirds, regardless of their foraging or resting activities. This does not bias the census results because the waterbirds remained in the same area for resting and foraging throughout all the 24-h period (Fasola & Canova 1993).

Waterbird habitat use was recorded in the three large muddy bays, Loyengalani, El Molo and Sandy Bay, where waterbird abundance and species richness were highest (Fasola *et al.* 1993a). We recorded the habitat of each waterbird that was foraging when spotted, while we walked along the shore, stopping every 100 m in order to scan all the waterbirds. An unbiased sample of all species was obtained, as waterbirds at Lake Turkana forage within a narrow strip along the shoreline, approximately 100 m in water and 50 m on land. Initially we observed all the individuals encountered, but during the last days of each survey we concentrated our records on those species for which we had less than 200 records. We recorded 13 444 foraging locations in February and 2306 in July. Foraging habitat was categorized into six categories: deep water (where birds swam); shallow water (where birds walked with water above their feet); water's edge (the narrow borderline between water and land); wet mud; dry mud (bare) and grass (soil covered by sparse and short grass in the few wet patches bordering dry mud). For birds in shallow water we estimated the proportion of their

Table 1. Waterbirds densities along the southeastern shores of Lake Turkana. Species status: *M* = Palaearctic migrants, breeding in the Palaearctic and spending the northern winter in the Turkana area; *P* = partial migrants with some populations breeding in equatorial Africa, or migrants within central Africa; *R* = residents, breeding in equatorial Africa. Species' prevailing food, categorized as: *L* = captures large prey; *G* = grazes plant and animal materials; *F* = filters small particles; *S* = pecks small prey. Status and food categories from Brown et al. (1982), and Urban et al. (1986)

	status	food	density (birds km ⁻¹)	
			Feb	Jul
Little Grebe <i>Tachybaptus ruficollis</i>	R	L	3.7	1.0
Great Cormorant <i>Phalacrocorax carbo</i>	R	L	6.1	9.8
Long-tailed Cormorant <i>Phalacrocorax africanus</i>	R	L	7.5	3.4
African Darter <i>Anhinga rufa</i>	R	L	0.02	
Great White Pelican <i>Pelecanus onocrotalus</i>	R	L	0.3	0.7
Pink-backed Pelican <i>Pelecanus rufescens</i>	R	L	1.8	2.1
Cattle Egret <i>Bubulcus ibis</i>	MPR	S	0.4	0.02
Black Heron <i>Egretta ardesiaca</i>	MR	L		0.04
Western Reef Egret <i>Egretta gularis</i>	P	L	0.03	
Little Egret <i>Egretta garzetta</i>	MR	L	2.8	2.7
Great White Egret <i>Casmerodius albus</i>	MR	L	0.1	
Grey Heron <i>Ardea cinerea</i>	MR	L	0.9	0.7
Black-headed Heron <i>Ardea melanocephala</i>	R	L		0.1
Goliath Heron <i>Ardea goliath</i>	R	L	0.1	0.1
Yellow-billed Stork <i>Mycteria ibis</i>	R	L	0.4	1.4
Glossy Ibis <i>Plegadis falcinellus</i>	MR	S	1.5	1.4
Sacred Ibis <i>Threskiornis aethiopicus</i>	R	S	1.2	1.0
African Spoonbill <i>Platalea alba</i>	MPR	L	2.0	1.0
Greater Flamingo <i>Phoenicopterus ruber</i>	MR	F	8.5	0.6
Lesser Flamingo <i>Phoeniconaias minor</i>	R	F	3.1	33.3
Osprey <i>Pandion haliaetus</i>	M	L	0.4	0.02
African Fish-eagle <i>Haliaeetus vocifer</i>	R	L	0.1	0.1
Eurasian Marsh-harrier <i>Circus aeruginosus</i>	M	L	0.02	
White-faced Whistling-duck <i>Dendrocygna viduata</i>	R	G	3.2	0.1
Egyptian Goose <i>Alopochen aegyptiacus</i>	R	G	16.1	11.0
Knob-billed Duck <i>Sarkidiornis melanotos</i>	MPR	G	0.02	
Eurasian Wigeon <i>Anas penelope</i>	M	F	0.9	
Northern Pintail <i>Anas acuta</i>	M	F	2.5	
Hottentot Teal <i>Anas hottentota</i>	R	F	0.5	
Northern Shoveler <i>Anas clypeata</i>	M	F	0.9	

	status	food	density (birds km ⁻¹)	
			Feb	Jul
Southern Pochard <i>Netta erythrophthalma</i>	MPR	F		0.05
Red-knobbed Coot <i>Fulica cristata</i>	R	G	1.8	0.3
Common Stilt <i>Himantopus himantopus</i>	MR	S	1.6	0.1
Eurasian Avocet <i>Recurvirostra avosetta</i>	MR	S	0.4	0.02
Senegal Thicknee <i>Burhinus senegalensis</i>	R	S	0.7	0.6
Common Pratincole <i>Glareola pratincola</i>	MR	S	4.1	3.0
Spur-winged Lapwing <i>Vanellus spinosus</i>	R	S	9.9	8.8
Gray Plover <i>Pluvialis squatarola</i>	M	S	0.1	
Ringed Plover <i>Charadrius hiaticula</i>	M	S	19.3	
Little Ringed Plover <i>Charadrius dubius</i>	M	S	0.1	
Kittlitz's Sandplover <i>Charadrius pecuarius</i>	R	S	11.3	3.2
Three-banded Plover <i>Charadrius tricollaris</i>	R	S	0.02	
Kentish Plover <i>Charadrius alexandrinus</i>	M	S	0.02	
Greater Sandplover <i>Charadrius leschenaultii</i>	M	S	0.02	
Caspian Plover <i>Charadrius asiaticus</i>	M	S	0.6	
Eurasian Curlew <i>Numenius arquata</i>	M	S	0.03	
Black-tailed Godwit <i>Limosa limosa</i>	M	S	5.6	0.05
Spotted Redshank <i>Tringa erythropus</i>	M	S	0.02	
Redshank <i>Tringa totanus</i>	M	S	0.2	0.02
Greenshank <i>Tringa nebularia</i>	M	S	4.1	0.2
Marsh Sandpiper <i>Tringa stagnatilis</i>	M	S	4.1	
Wood Sandpiper <i>Tringa glareola</i>	M	S	1.8	0.04
Common Sandpiper <i>Actitis hypoleucos</i>	M	S	5.9	0.05
Ruddy Turnstone <i>Arenaria interpres</i>	M	S	0.8	
Little Stint <i>Calidris minuta</i>	M	S	168.3	
Curlew Sandpiper <i>Calidris ferruginea</i>	M	S	8.8	
Ruff <i>Philomachus pugnax</i>	M	S	3.2	
Grey-headed Gull <i>Larus cirrocephalus</i>	R	L	13.1	21.6
Black-headed Gull <i>Larus ridibundus</i>	M	L	4.7	0.2
Lesser Black-backed Gull <i>Larus fuscus</i>	M	L	3.04	0.8
Gull-billed Tern <i>Sterna nilotica</i>	M	L	1.4	0.05
Caspian Tern <i>Sterna caspia</i>	MR	L	0.4	
Little Tern <i>Sterna albifrons</i>	M	L	0.3	
Whiskered Tern <i>Chlidonias hybridus</i>	MR	L	0.2	
White-winged Black Tern <i>Chlidonias leucopterus</i>	M	L	3.6	
African Skimmer <i>Rynchops flavirostris</i>	R	L	1.3	0.3

legs that were submerged, and afterwards we calculated water depths from data on average tarsus length (Brown *et al.* 1982, Urban *et al.* 1986). During data analysis, depths were classed as <2, 2–4, 4–8, 8–16, 16–32, and >32 cm. We also recorded any aggressive interaction among the waterbirds during the first scan of their activity.

The availability of invertebrate aquatic prey was found by: collecting cylindrical samples of mud with 11 cm diameter by 20 cm depth (92 samples in February and 66 in July), sieving the material through a 1-mm mesh, storing the organic material in formalin, and identifying the invertebrates under a dissection microscope. Mud samples were collected at an equal number of sites in water, lake edge, and wet mud.

A species' distribution among habitat categories was compared with that of another species, or with that of the same species in a different period, by χ^2 tests based on the location frequencies of each species. Since behaviour within a flock is not independent among individuals, the tests were conservative, being based on the frequencies of flocks (conspecific birds observed from one spot and foraging in the same habitat category) and not on the frequencies of individual birds.

Results

Seasonal communities

We recorded 66 waterbird species (Table 1), a large subset of those found during more extensive surveys of lake Turkana by Hopson & Hopson, 1975 (120 species), by Schekkerman & van Wetten, 1987 (83 species) and by Bennun & Fasola, in press (107 species). The species recorded by others but not by us are those tied to habitats absent from our area, e.g. reed beds, or species of sporadic occurrence.

Residents or partial migrants maintained similar densities in July and February (Table 1). Most Palaearctic migrant species were completely absent in July, with only Greenshanks, Black-headed and Lesser Black-backed Gulls present in notable numbers.

In February, the Palaearctic migrants dominated (69 per cent of the birds) the waterbird community (Table 2), whereas in July the community was composed almost exclusively of residents (60 per cent) and partial migrants (36 per cent). The overall waterbird density in July was only one third of that in February. The low July densities were mainly due to the decrease of the Recurvirostridae, Charadriidae, Scolopacidae and Anatidae, and of species which feed by pecking small prey. The other families—and the species which feed by capturing large prey, by grazing and by filtering—maintained similar densities (Table 2).

Habitat use

Species were unevenly distributed on the four types of shore category. Most species had their highest densities on muddy shores and pebbles, many used sand (though to a lower degree), and a few preferred rocks, as already described by Fasola *et al.* (1993b). In this paper we only describe habitat use only on muddy shores because it had the

Table 2. *Seasonal composition of the waterbird community of Lake Turkana*

	Density (birds/km)	
	February	July
Residents	77.0	65.3
Partial migrants	29.9	39.0
Palearctic migrants	239.7	4.6
Anatidae	25.8	11.4
Ciconiiformes	9.1	7.4
Accipitridae	0.7	0.2
Laridae, Sternidae	31.6	25.9
Podicipedidae, Phalacrocoracidae, Anhingidae, Pelecanidae	18.8	17.0
Phoenicopteridae	19.9	33.9
Recurvirostridae, Burhinidae, Charadriidae, Scolopacidae	240.7	13.1
Captures large prey	53.5	46.0
Grazes	21.1	11.4
Filters	24.7	34.0
Pecks small prey	247.5	17.5

Table 3. *Frequency of aggressions (percentage of birds scanned that were engaged in aggressions) recorded in February*

Aggressor	Aggressed (- for conspecifics)	
African Spoonbill	-	0.23
Ringed Plover	-	0.27
Ringed Plover	Kittlitz's Plover	0.80
Kittlitz's Plover	-	0.29
Little Stint	-	0.08
Black-tailed Godwit	-	0.08
Ruff	Curlew Sandpiper	0.45
Greenshank	-	0.38

highest species richness and bird abundance, and because it reflects a consistent zonation from the open water to the dry land.

We describe habitat use for the 26 dominant species only, and omit the species which had fewer than six individuals in our study area; that mostly foraged away from the strip of shoreline that could be effectively surveyed (Little Grebe, Cattle Egret, Common Pratincole, all the Laridae and Sternidae); that foraged almost entirely in deep water (Great Cormorant, Long-tailed Cormorant, Great White and Pink-backed Pelicans, Northern Pintail, Northern Shoveler and Red-knobbed Coot); and those that were almost entirely restricted to rocks and pebbles (Senegal Thicknee, Redshank, Ruddy Turnstone).

Figures 1, 2 and 3 show foraging habitat use on muddy shores by the 26 waterbird species. Grouping of species in these figures in pairs (e.g., Grey and Goliath herons in Fig. 1) or trios (e.g., Egyptian Goose, White-faced Whistling Duck and Hottentot Teal in Fig. 3) is based on similarity in taxonomy and size.

Despite a partial overlap in foraging habitat by the members of these similar pairs or trios, each species used habitats that differed significantly from those used by similar species (the frequency distributions of each species pair were all significantly different when submitted to χ^2 tests), during both February and July. In many cases, habitat use simply reflected the capacity of the larger species to wade in deeper waters than the smaller ones (Goliath Heron *v* Grey Heron, Great White Egret *v* Little Egret, Avocet *v* Black-winged Stilt, Greenshank *v* Marsh Sandpiper). In other cases, habitat differences seem not to reflect merely size differences. Lesser Flamingos foraged mostly in very shallow waters or even on wet mud, and were clearly segregated from Greater Flamingos. Kittlitz's Plovers were more terrestrial than the very similar Ringed Plovers, while Ruffs were sharply segregated from Black-tailed Godwits and Common Sandpipers from Wood Sandpipers.

During July, data on habitat use were available for only seven species (Figs. 1, 2, 3), and we could only test seasonal differences in habitat use on these seven. Only Lesser Flamingos showed a significant shift towards deeper waters in July than in February ($\chi^2 = 27.3$, d.f. = 6, $P < 0.01$). The other six species foraged in the same habitat categories as in February (the χ^2 tests on the location frequencies of the same species in February and in July were not significant).

Prey availability was similar, and very low, in both February and July. Prey densities in the two periods were 8.3 and 9.6 items m^{-2} , respectively. Prey composition in mud comprised insect larvae and worms, ranging in size 4–7 mm in length and 1–3 mm in diameter.

Inter- or intra-specific aggressions were observed only in February, and at very low frequencies (Table 3). African Spoonbills, Ringed Plovers, Kittlitz's Plovers, Little Stints, Black-tailed Godwits and Greenshanks performed interspecific aggressions, but only for less than 0.5 per cent of the individuals scanned. The only interspecific aggression was seen in Ringed Plovers which displaced Kittlitz's Plovers (0.8 per cent of individual Ringed Plovers scanned), and in Ruffs which displaced Curlew Sandpipers (0.5 per cent of Ruffs scanned).

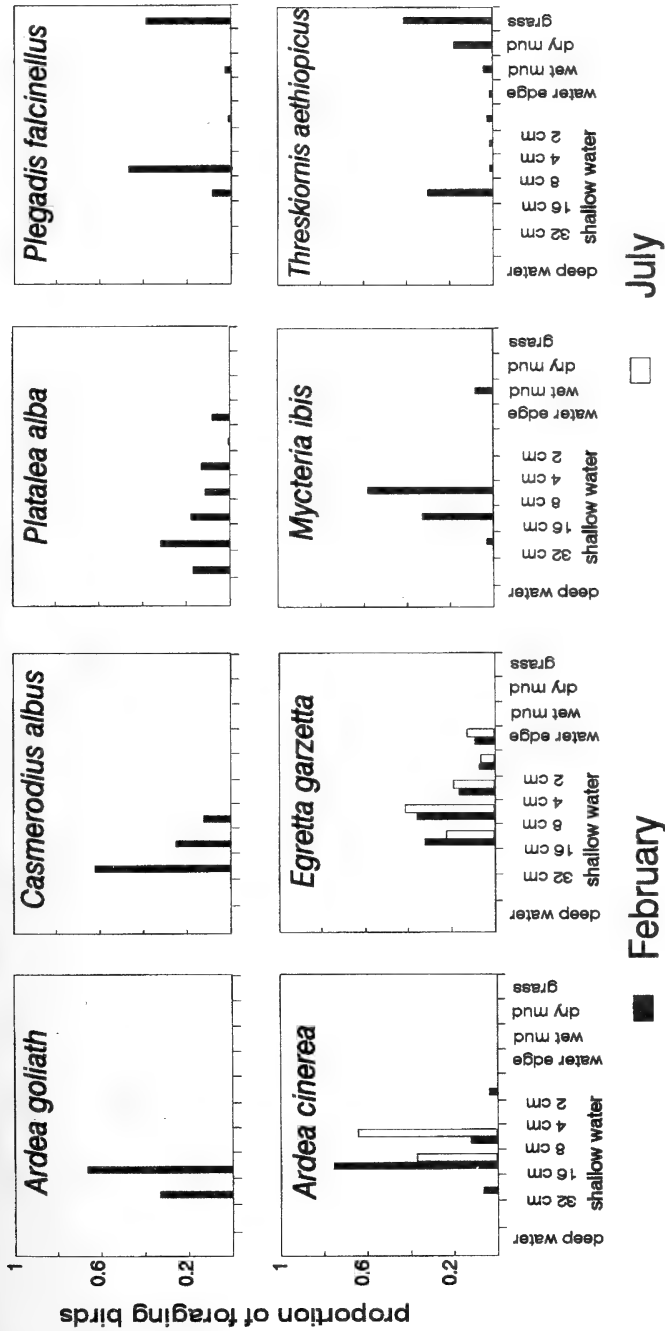


Figure 1. Foraging locations of Ciconiiformes on muddy shores

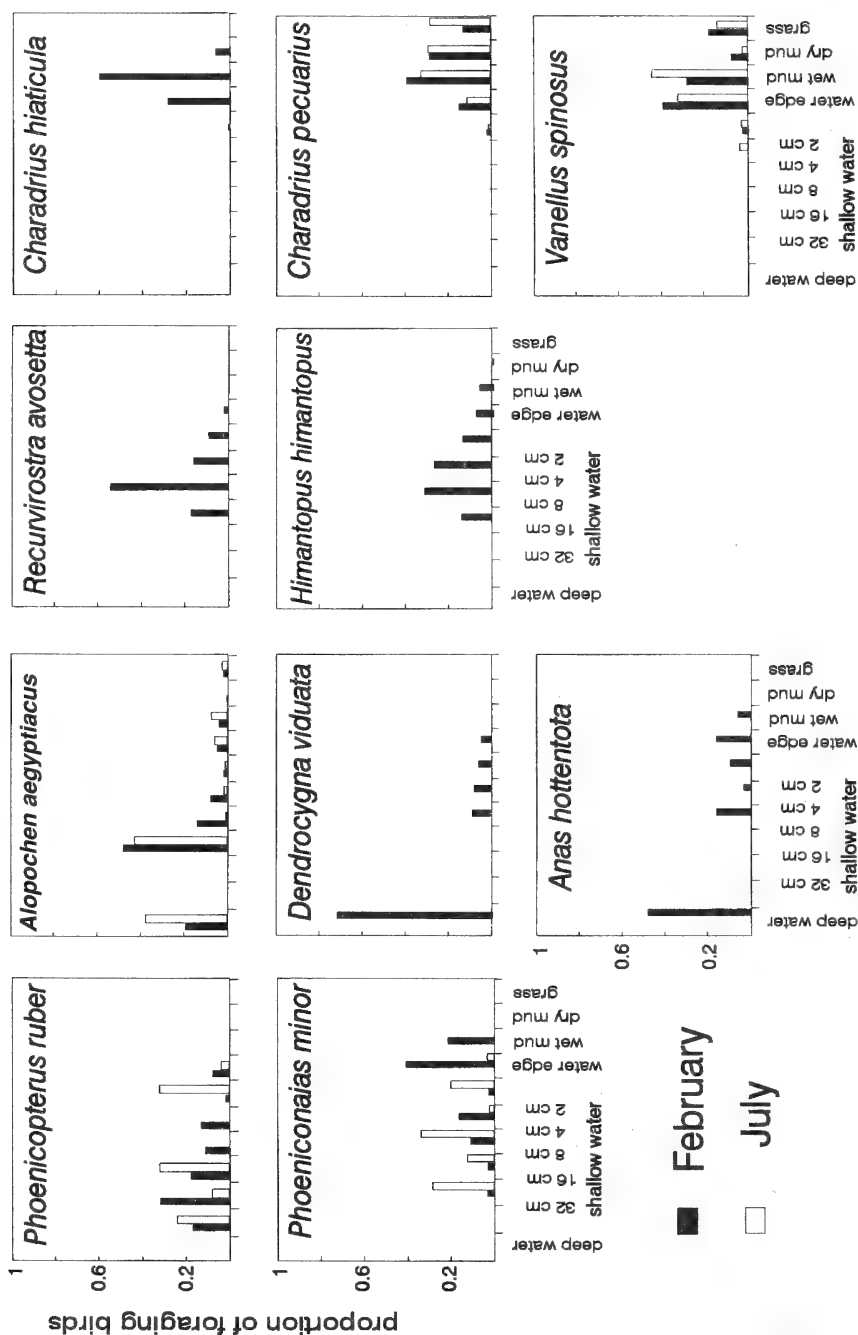


Figure 2. Foraging locations of Phoenicopteridae, Anatidae and some Charadriiformes on muddy shores

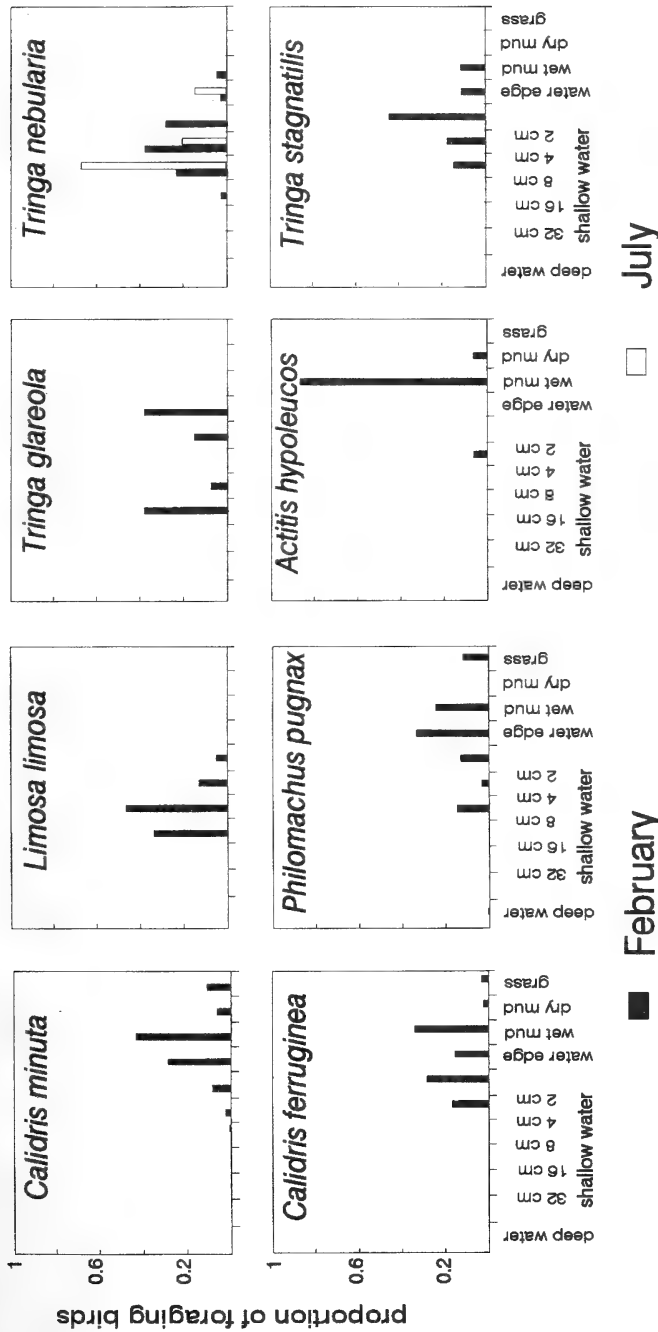


Figure 3. Foraging locations of some Charadriiformes on muddy shores

Discussion

Habitat use by foraging waterbirds may be determined by their feeding behaviours and by physical constraints: for example, with divers preferring deep water. Species that feed by wading are constrained to depths dictated by the length of their tarsi. Competition—the common use of a limiting resource by consumer species—may further restrict habitat uses as it is determined by behaviour and physical constraints. However, habitat segregation provides only weak evidence of competition and even if niches were arranged randomly, differences would still exist (Wiens 1989). Two types of competitive interactions are commonly recognized: exploitation (diminished resource availability because of use by other species), and interference (aggression limiting access to resources). Aggressive interference between migrants and residents seems to be infrequent (Leisler, 1992), but it was documented for landbirds in West Africa (Edington & Edington, 1983) and for ducks overwintering in the temperate Nearctic (Alexander, 1987). Habitat is the resource which most frequently segregates bird species within guilds (Wiens 1989), and migrants and residents under competitive pressure can be expected to display habitat partitioning.

Our results, and particularly the following points, suggest that waterbird communities at Lake Turkana are exposed to conditions which may potentially provide a competitive context.

- The densities of resident and partial migrant waterbirds are similar in February and in July, while those of Palaearctic migrants are 20 times higher in February than in July, thus producing a sharp increase in the abundance of possible competitors. The increase was mainly due to the arrival of species that feed on small invertebrate prey.
- The availability of small invertebrate prey in mud seems to remain constant in February and in July, contrasting with temperate latitudes, where the densities of intertidal invertebrates fluctuate markedly between seasons (Puttick 1984). It is surprising that prey densities in our samples were lower by two orders of magnitude than in the samples collected by similar methods in temperate latitudes (Meire & Kuyken 1984, Szekely & Bamberger 1992).
- Migrants overlapped greatly in use of foraging habitats with residents. This overlap was particularly high for small waders and for Ciconiiformes; the migrant Anatidae, on the other hand, were partially segregated from resident geese and ducks.

However, the following other results indicate that competition is not relevant.

- The segregation of most species into specific foraging habitats seems not to result from competition but from physical constraints of tarsus length. There are only a few species pairs where the partial segregation in foraging habitat suggests some interspecific competitive interaction: Kittlitz's *v* Ringed Plovers (resident *v* migrant); Ruffs *v* Black-tailed Godwits and Common *v* Wood Sandpipers (migrant *v* migrant).

- No habitat shifts occurred between February and July despite the densities of possible competitors having greatly changed. The only case of habitat shift occurred in Lesser Flamingos during July, when their densities were higher than in February and the densities of Greater Flamingos lower. Lesser Flamingos seem to be displaced spatially when Greater Flamingos abound, although it is practically impossible that these two flamingos compete for food, given their totally different food requirements (Brown *et al.* 1982).
- The frequency of inter-species aggressions was very low, and were recorded only between Ringed and Kittlitz's Plovers, and Ruffs and Curlew Sandpipers. However, Kittlitz's Plovers did not shift their foraging habitat in July, when the other plovers were absent, therefore they do not seem to compete with the other plovers, despite their partial habitat segregation and the occurrence of aggressions.

We conclude that at Lake Turkana, the arrival of Palaearctic migrant and partial migrant waterbirds does not induce competition with the residents, despite the strong increase in density, particularly of waders and species capturing small invertebrate prey.

No other information exists on habitat use and competition by waterbirds in Central Africa. In the Neotropics, Duffy *et al.* (1981) found no evidence that inter-species competition affects the distribution of wintering shorebirds. On the other hand, for temperate Europe there is evidence that during winter, waders may deplete their food supplies and suffer high mortalities (Evans *et al.* 1984). Similarly to our results, there are indications that the potential competition between Palaearctic migrant landbirds and their Afrotropical resident analogues is less than might be expected (Morel 1973, Hogg *et al.* 1984, Leisler 1992).

Acknowledgements

The expeditions to Lake Turkana were financed by a grant AI93.00112.04 from the Comitato Nazionale Ricerche and by contributions from the Cassa Risparmio delle Province Lombarde (Pavia). Others who provided support were the Istituto Nazionale Fauna Selvatica (Bologna, Italy), Zeiss (Milano), Ferrino (Torino), Olivetti Equatorial Ltd and Sogei Ltd (Kenya). Technical support was provided by the Ornithology Department of the National Museums of Kenya for which we are most grateful. We also wish to thank the participants, and in particular, L. Bennun, L. Biddau, L. Borghesio and L. Canova, for the part they played in the expeditions.

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Scopus 18: 20–33, November 1994

Received 25 May 1994

Notice



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- promote and work with local African societies
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Bird observations on Wasini Island, Kenya

Colin Ryall

During four visits of one to three days duration to Wasini Island in April 1985, November 1985, March 1986 and July 1987, birds inhabiting the various habitats were noted. Some of these observations extend the range of species as defined by Lewis & Pomeroy in their *Bird atlas of Kenya* (1989, Rotterdam: Balkema); the island occupies QSD 114C.

Study site

Wasini Island lies at 4°40S, 39°20E at the southern extreme of the Kenyan coast, a few kilometres from the Tanzanian border, and is separated from the Kenyan mainland by the 1.5-km-wide Shimoni Channel along its northern shore. It is a low-lying island, less than 20 m at its highest point—Ras Zinza Mkono—at the easternmost promontory. It is 430 ha in area, measuring about 5 km east to west and 0.8 to 1.5 km north to south (Fig. 1).

The southern shore of Wasini Island forms the northern extent of the Kisite/Mpunguti Marine National Park. North, east and west coasts are mostly bounded by undercut coral cliffs, while the remaining shores are of lower and less sheer elevation.

The island has two small settlements, both facing the mainland, on the northern shore—Wasini at the western end and Mkwiro close to the eastern end. The limited water supply, in the form of a rain cistern near each village, which become dry during prolonged dry spells, and the thinness of the soil accounts for the small human population on the island. There are also scattered groves of coconut palms, including many dead trunks.

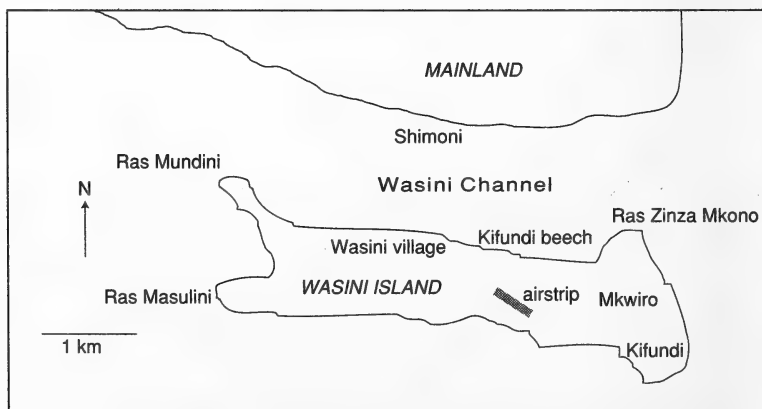


Figure 1. Map of Wasini Island

Habitat types and avifauna

Though a detailed botanical survey was not carried out, some general observations on stand types were made so that several distinct habitats were discernible. These are presented below along with selected bird observations while a full species list is given in Table 1.

Tidal flats: All shores except the exposed eastern end had wide areas of exposed and muddy tidal flats which provided feeding areas for waders and herons.

Little Egret *Egretta garzetta* both white and dark phases were common.

Crab Plover *Dromas ardeola* observed on all visits.

Broad-billed Sandpiper *Limicola falcinellus* one was seen on 6 April 1985 feeding to the south of the island.

Mangrove swamp: the most sheltered shores, W to SW, supported a zone of dense mangrove swamp, some trees being of considerable girth.

Dwarf woodland: the exposed eastern end of the island was covered by a dense growth of relatively intact bush and dry dwarf woodland, containing *Pandanus kirkii* and *Euphorbia nyikae* as well as other species that were similar to those still found in some parts of the mainland coast.

Ashy Flycatcher *Muscicapa caerulea* two birds seen on 21 July 1987.

Little Purple-banded Sunbirds *Nectarinia bifasciata* numerous.

Secondary forest and baobabs: remnants of past forest took the form of one or two small patches of degraded secondary growth on the north edge and baobab trees, larger specimens being concentrated mainly in the N and W and more stunted ones in the SE.

Brown-headed Parrot *Poicephalus cryptoxanthus* between ten and twenty were seen roosting in large baobabs at the western end near Wasini Village, on all visits. Some were seen flying in at dusk from the mainland to the north. Breeding was suspected as some parrots occupied holes in baobabs during April 1985.

Mottle-throated Spinetail *Telacanthura ussheri* two seen feeding near baobabs at SE of island on 22 Nov 1985.

Böhm's Spinetail *Neafrapus boehmi* one was observed flying along the edge of remnant forest on 6 April 1985.

Broad-billed Roller *Eurystomus glaucurus* two were seen on 23 Nov 1985.

Silvery-cheeked Hornbill *Bycanistes brevis* seen in forest remnants and also flying across the Shimoni Channel from the mainland.

Green Barbet *Buccanodon olivaceum* a lone bird was seen on 6 April 1985 in a small patch of secondary growth, which certainly could not support a viable breeding population. Either this was a surviving remnant or had flown 1.5 km from the forest patches on the mainland where the species was still frequent at that time.

Mosque Swallow *Hirundo senegalensis* common feeding over much of the island and a pair were seen nesting in a hole in a bough of a baobab on 22 Nov 1985.

Red-capped Robin Chat *Cossypha natalensis* recorded on 1 March 1985 and July 1987.

Scrub: most of the central region was covered in low mixed *Lantana*-dominated scrub interspersed with patches of higher indigenous bush and small trees. This contained good numbers of the various sunbird species recorded.

White-browed Scrub Robin *Cercothrichas leucophrys* two seen on 20 and 21 July 1987 in the arid scrub on coral rag at the western end appeared to be of the white-winged form, though this is well south of the recognised range of this race.

Spectacled Weaver *Ploceus ocularis* recorded on several visits plus a number of unoccupied nests suggested breeding on the island.

Dry grassland: in the centre of the island is a disused landing strip which, though partially invaded by *Lantana*, provided the only tract of dry grassland.

Senegal Plover *Vanellus lugubris* a group of five were seen on 22 Nov 1985.

Additions to *A bird atlas of Kenya*

Wasini Island is situated in QSD 114C of *A bird atlas of Kenya* of Lewis & Pomeroy (1989). These observations extend the range or update records of some of the species seen.

Revival of old records Rattling Cisticola (21 July 1987), Winding Cisticola (22 Nov 1985, 21 July 1987), Tawny-flanked Prinia (6 April 1985, 21 July 1987).

Extensions of range Brown Snake Eagle (20 July 1987), Great Sparrowhawk (23 Nov 1985), Harlequin Quail (21 July 1985), Sanderling (6 April 1985), Little Stint (6 April 1985), Broad-billed Sandpiper (6 April 1985), Lesser Black-backed Gull (6 April 1985), Eurasian Bee-eater (23 Nov 1985), White-browed Scrub Robin (20 and 21 July 1987), Bare-eyed Thrush (22 Nov 1985), Richard's Pipit (21 July 1987), Red-cheeked Cordonbleu (6 April 1985).

Extension of suspected breeding range Brown-headed Parrot (in nest-holes 6 April 1985), Spectacled Weaver (empty nests 23 Nov 1985).

Table 1. *Species observed on Wasini Island; habitats in which observed and estimate of frequency*

Habitats: CZ = coastal zone; MS = mangrove swamp; TF = tidal flats; DG = dry grassland; OF = overflying; SG = secondary growth/forest remnant; B = baobabs; SC = scrub; DW = dwarf woodland; ST = settlements.

Frequency: S = Scarce (only 1 or 2 birds); O = occasional (small numbers);

R = regular (moderate numbers); F = frequent (common). **Status:** Palaearctic migrants marked *

Long-tailed Cormorant <i>Phalacrocorax africanus</i>	MS; R
Grey Heron <i>Ardea cinerea</i>	TF; F
Black-headed Heron <i>A. melanocephala</i>	TF, DG; F
Green-backed Heron <i>Butorides striatus</i>	MS; F
Great White Egret <i>Egretta alba</i>	TF; R
Black Heron <i>E. ardesiaca</i>	TF; O
Little Egret <i>E. garzetta</i>	TF; F
African Reef Heron <i>E. gularis</i>	TF; O
Woolly-necked Stork <i>Ciconia episcopus</i>	MS; O
Yellow-billed Stork <i>Mycteria ibis</i>	TF; R
Hadada <i>Bostrychia hagedash</i>	TF, MS, DG; F
Sacred Ibis <i>Threskiornis aethiopica</i>	TF; F
Palm-nut Vulture <i>Gypohierax angolensis</i>	SC/OF; R
Brown Snake Eagle <i>Circaetus cinereus</i>	SC, SG; S
Great Sparrowhawk <i>Accipiter melanoleucus</i>	SG; S
African Goshawk <i>A. tachiro</i>	SG; O
Tawny Eagle <i>Aquila rapax</i>	SC; S
Lizard Buzzard <i>Kaupifalco monogrammicus</i>	SC, SG; O
Fish Eagle <i>Haliaeetus vocifer</i>	CZ; F
Black Kite <i>Milvus migrans</i>	ST; F
Bat Hawk <i>Machieramphus alcinus</i>	SC/OF; S
*Osprey <i>Pandion haliaetus</i>	CZ; S
Peregrine Falcon <i>Falco peregrinus</i>	CZ; S
Harlequin Quail <i>Coturnix delegorguei</i>	DG; S
Crested Francolin <i>Francolinus sephaena</i>	SC, SG; F
*Ringed Plover <i>Charadrius hiaticula</i>	TF; F
*Great Sandplover <i>C. leschenaultii</i>	TF; F
*Mongolian Sandplover <i>C. mongolus</i>	TF; F
*Grey Plover <i>Pluvialis squatarola</i>	TF; F
Senegal Plover <i>Vanellus lugubris</i>	DG; O
*Common Sandpiper <i>Actitis hypoleucos</i>	RS; F
*Whimbrel <i>Numenius phaeopus</i>	TF; F
*Greenshank <i>Tringa nebularia</i>	TF; F
*Marsh Sandpiper <i>T. stagnatilis</i>	TF; O
*Terek Sandpiper <i>Xenus cinereus</i>	TF; O
*Sanderling <i>Calidris alba</i>	TF; O
*Curlew Sandpiper <i>C. ferruginea</i>	TF; F
*Little Stint <i>C. minuta</i>	TF; O
*Broad-billed Sandpiper <i>Limicola falcinellus</i>	TF; S

continued

*Turnstone <i>Arenaria interpres</i>	RS; R
Crab Plover <i>Dromas ardeola</i>	TF; R
Water Thicknee <i>Burhinus vermiculatus</i>	MS, SC; F
*Lesser Black-backed Gull <i>Larus fuscus</i>	CZ, ST; O
Sooty Gull <i>L. hemprichii</i>	CZ; F
Little Tern <i>Sterna albifrons</i>	CZ; O
Lesser Crested Tern <i>S. bengalensis</i>	CZ; R
*Caspian Tern <i>S. caspia</i>	CZ; O
Roseate Tern <i>S. dougallii</i>	CZ; R
Sooty Tern <i>S. fuscata</i>	CZ; R
*Common Tern <i>S. hirundo</i>	CZ; R
White-cheeked Tern <i>S. repressa</i>	CZ; O
Ring-necked Dove <i>Streptopelia capicola</i>	SC; F
Red-eyed Dove <i>S. semitorquata</i>	SG; R
Emerald-spotted Wood Dove <i>Turtur chalcophilus</i>	SC, DG; F
Tambourine Dove <i>T. tympanistria</i>	SG; S
Green Pigeon <i>Treron australis</i>	SG, BB; O
Brown-headed Parrot <i>Poicephalus cryptoxanthus</i>	BB; F
Didric Cuckoo <i>Chrysococcyx caprius</i>	SC; O
*Eurasian Cuckoo <i>Cuculus canorus</i>	SC; S
Yellowbill <i>Ceuthmochares aereus</i>	SG; S
White-browed Coucal <i>Centropus superciliosus</i>	SC; F
Slender-tailed Nightjar <i>Caprimulgus clarus</i>	SC; R
Little Swift <i>Apus affinis</i>	SC, OF; R
Palm Swift <i>Cypsiurus parvus</i>	SC, SG, MS; F
Böhm's Spinetail <i>Neafrapus boehmi</i>	SG; S
Mottle-throated Spinetail <i>Telacanthura ussheri</i>	BB; S
Speckled Mousebird <i>Colius striatus</i>	SC; F
Pied Kingfisher <i>Ceryle rudis</i>	TF; R
Mangrove Kingfisher <i>Halcyon senegaloides</i>	MS; O
*Eurasian Bee-eater <i>Merops apiaster</i>	SC; S
Carmine Bee-eater <i>M. nubicus</i>	SC; O
Little Bee-eater <i>M. pusillus</i>	SC; R
Magagascar Bee-eater <i>M. superciliosus</i>	SC, MS; O
Lilac-breasted Roller <i>Coracias caudata</i>	SC; R
*Eurasian Roller <i>C. garrulus</i>	SC; S
Broad-billed Roller <i>Eurystomus glaucurus</i>	SG; S
Hoopoe <i>Upupa epops</i>	DG; S
Silvery-cheeked Hornbill <i>Bycanistes brevis</i>	SG; F
Crowned Hornbill <i>Tockus alboterminatus</i>	SC, SG; R
Green Barbet <i>Buccanodon olivaceum</i>	SG; S
Yellow-rumped Tinkerbird <i>Pogoniulus bilineatus</i>	SG; S
Lesser Honeyguide <i>Indicator exilis</i>	SG; S
Flappet Lark <i>Mirafra rufocinnamomea</i>	DG; R
Striped Swallow <i>Hirundo abyssinica</i>	DG, SC; F
Ethiopian Swallow <i>H. aethiopica</i>	SC, ST; R
*Eurasian Swallow <i>H. rustica</i>	DG, SC, ST; R
Mosque Swallow <i>H. senegalensis</i>	SC, ST, BB; R
Drongo <i>Dicrurus adsimilis</i>	SC, SG, ST; R

African Golden Oriole <i>Oriolus auratus</i>	SG; S
Black-headed Oriole <i>O. larvatus</i>	SG; O
*Golden Oriole <i>O. oriolus</i>	SG; S
Pied Crow <i>Corvus albus</i>	SC,ST; O
Zanzibar Sombre Greenbul <i>Andropadus importunus</i>	SC; O
Common Bulbul <i>Pycnonotus barbatus</i>	SC,SG,ST; F
White-browed Scrub Robin <i>Cercotrichas leucophrys</i>	SC; S
White-browed Robin Chat <i>Cossypha heuglini</i>	SC; O
Red-capped Robin Chat <i>C. natalensis</i>	SG; O
Bare-eyed Thrush <i>Turdus tephronotus</i>	SC; S
Grey-backed Camaroptera <i>Camaroptera brachyura</i>	SC,SG; F
Rattling Cisticola <i>Cisticola chiniana</i>	SC; O
Winding Cisticola <i>C. galactotes</i>	SC; O
Tawny-flanked Prinia <i>Prinia subflava</i>	SC,DG; R
Pale Flycatcher <i>Bradornis pallidus</i>	SC; R
Ashy Flycatcher <i>Muscicapa caerulescens</i>	DW; S
*Spotted Flycatcher <i>M. striata</i>	SC; F
Paradise Flycatcher <i>Terpsiphone viridis</i>	SG; R
Richard's Pipit <i>Anthus novaeseelandiae</i>	DG; R
African Pied Wagtail <i>Motacilla aguimp</i>	TF,ST; F
Black-backed Puffback <i>Dryoscopus cubla</i>	SG; S
Tropical Boubou <i>Lanarius ferrugineus</i>	SC; O
*Red-backed Shrike <i>Lanius collurio</i>	SC; R
*Red-tailed Shrike <i>L. isabellinus</i>	SC; S
Black-breasted Glossy Starling <i>Lamprotornis corruscus</i>	SG,BB
Collared Sunbird <i>Anthreptes collaris</i>	SC,SG; R
Little Purple-banded Sunbird <i>Nectarinia bifasciata</i>	SC,SG,MS,DW; F
Olive Sunbird <i>N. olivacea</i>	SG; R
Mouse-coloured Sunbird <i>N. veroxii</i>	SC,DW; O
Pin-tailed Whydah <i>Vidua macroura</i>	DG; O
Spectacled Weaver <i>Ploceus ocularis</i>	SC; R
Grey-headed Sparrow <i>Passer griseus</i>	SC,DG; F
Red-billed Firefinch <i>Lagonosticta senegala</i>	DG; O
Red-cheeked Cordonbleu <i>Uraeginthus bengalus</i>	DG; O
Bronze Mannikin <i>Lonchura cucullata</i>	DG,SC; R
Total number of species = 123	
Number of Palearctics species = 26	

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New records of Sokoke Scops Owl *Otus ireneae*, Usambara Eagle Owl *Bubo vosseleri* and East Coast Akalat *Sheppardia gunningi* from Tanzania

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Robert J. Timmins and Andrew W. Perkin

This paper summarizes significant new records for three threatened forest birds, mostly recorded during fieldwork for the Cambridge Tanzania Rainforest Project in the East Usambara Mountains in 1992 and follow-up surveys in 1993. A full report on these surveys, which include work on mammals, amphibians, African violets *Streptocarpus* spp. and human use of the forests can be found in the Cambridge Tanzania Rainforest Project (in prep.).

Six study sites were visited in July–September 1992, five in the Sigi-Muse valley (centred on 38°43E, 5°00S) at 200–400 m altitude (Kambai Forest Reserve, Segoma Forest Reserve, Kwamgumi Forest Reserve, Marimba Forest Reserve and Kambai Public Land) and one about 10 km to the east on the coastal plain at 180 m (Mtapwa Public Land). Two sites, Kambai and Kwamgumi Forest Reserves, were revisited in September–October 1993. Mist-netting was performed at the first five sites. All consisted of lowland semi-deciduous forest. In total, six threatened and three near-threatened bird species were found.

There are perhaps 125 km² of gently-sloping lowland forest below 400 m in the Usambaras and a further 108 km² on steep slopes from 400–800 m (see Evans *et al.* in prep, Cambridge Tanzania Rainforest Project in prep.). It is thought that the avifaunas of these two habitat types may differ significantly (Evans *et al.* in prep.). Clearance for agriculture will soon destroy all lowland forest outside government forest reserves and even forest reserves are being degraded by pit-sawing and cutting of poles for building.

Species accounts

Sokoke Scops Owl *Otus ireneae*

Recent records

A rufous-phase Sokoke Scops Owl was caught at dusk, low down in a mist net in Kambai Forest Reserve in August 1992. On the follow-up visit in 1993, the call of Sokoke Scops Owl was heard and tape-recorded in Kwamgumi Forest Reserve (three birds simultaneously on the one night of the visit in October) and Kambai Forest Reserve (one bird on most of the nine nights of the September visit). These are the first records for Tanzania and the first away from the type locality, Arabuko-Sokoke Forest in Kenya (Ripley 1966).

Call

The call was a string of monotonous whistles uttered a little less than 1 s apart. They were in bursts of 10–20 (not 40–120 as noted in Britton & Zimmerman (1979)) with a pause of up to 1 min between bursts. In quality, the call was indistinguishable from the recording on Marshall (1978). Calling was not heard at dawn or dusk, but otherwise continued throughout the night, individual birds sometimes calling for hours on end. Birds called from up to 15 m up in tree crowns and were extremely difficult to see.

Description

Photographs of the bird in the hand have been compared with specimens in the British Museum (Natural History) (one bird) by team members and in the National Museum of Kenya, Nairobi (two birds) by Dr Leon Bennun and team members. There were slight differences, but these are thought to be due to individual variation in view of the similarity in the calls.

Table 1. *Biometrics of the Usambara individual, the type specimen of Sokoke Scops Owl (from Ripley 1966), two caught by Kelsey & Langton (1984) and four caught by Munir Virani (per L. Bennun, in litt., 1993) in Arabuko-Sokoke Forest*

Individual	weight (g)	wing (mm)	bill (mm)	tarsus (mm)	tail (mm)
Kambai FR	51	120	10.0	21.0	62
Type	—	112.5	9.5	20	65.5
Kelsey & Langton	46, 53	115, 119			
M. Virani	51, 43,	116, 120,		17.0, 21.8,	60.3, 58.5,
	51, 46	120, 124		22.1, 23.2	55.4, 61.3

In addition, Ripley & Bond (1971) list three other specimens, weighing 46 g, 50 g and 55 g.

Plumage description (taken at time of capture)

Overall: small, generally cinammon brown, paler below but still cinammon. Many cream shaft-streaks, marked fore and aft with black, on head, back, wing- and tail-coverts and underside.

Head: facial disc cinammon, as head. Few black markings and many creamy shaft streaks without black marks. Black "eyebrows". Crown feathers with diamond-shaped black spots.

Upperside: nape, mantle, upper tail-coverts, scapulars, lesser and median coverts, with cream and black blob-shaped shaft streaks.

Underside: breast to belly pale cinammon with black and cream shaft streaks. Feathers of lower face slightly more heavily spotted. Vent pale tawny. Undertail-coverts pale tawny with small black tips. Undertail pale brown with black blotching.

Tail: cinammon above with blotchy black bars. Outer webs of outer tail feathers have a creamier base colour, base colour becoming progressively more cinammon towards the central pair.

Upperwing: alula—inner two feathers barred cinnamon and black, like tail. Outer feather with five bold white spots on the outer web. Greater coverts cinnamon with a large amount of black blotching, especially the greater primary coverts. Primaries black, spotted with white on the outer web of the outermost few, spots becoming tawny by the innermost primary. Three tawny spots on each inner web. Secondaries barred cinnamon on black.

Underwing: lesser coverts pale tawny inside, black with tawny tips towards the carpal joint. Greater coverts cream, tipped black. Flight feathers as upper surface, except the pale spots become creamy-buff, or white on the outermost few primaries.

‘Bare’ parts: iris: yellow; bill: pale creamy-horn; gape: mostly pink; rictal bristles: black; feet: pink; claws: black; legs: feathered.

Conservation status

It seems likely that a full survey using playback of the call would reveal quite a large population in these two forests and others in the lowlands. Such a survey is a high priority. When considered restricted to Arabuko-Sokoke, the species was listed in Collar & Stuart (1985) as Endangered, the highest category of threat. This is now clearly too pessimistic—the population and degree of threat are probably comparable to that of the Usambara Eagle Owl *Bubo vosseleri*, which is listed as Rare.

Usambara Eagle Owl *Bubo vosseleri*

Previous records

The Usambara Eagle Owl is a poorly known bird. Following its discovery in 1908 (Reichenow 1908) it was not found again until 1962 (Moreau 1964). By 1985 there had been only 19 records (Collar & Stuart 1985) and the bird was listed as globally threatened, with status Rare, in the *African Red Data Book* (Collar & Stuart 1985). As a measure of its scarcity, White (1974) never heard in the wild the call he knew from a captive bird, despite living at Amani in the East Usambaras for four years, except when a single wild bird called in response to the captive one. All confirmed records were from between 900 m and 1300 m in the submontane forests of northeast Tanzania, mostly from the Amani area but with a few from the eastern slopes of the West Usambaras. There was also one possible sight record from the Nguru Mountains (Moreau 1964).

The bird is closely related to Fraser’s Eagle Owl *Bubo poensis*, a relatively common lowland forest species from west and central Africa, though their ranges are over 1000 km apart (Olney 1984). Moreau (1964) and Olney (1984) discuss the plumages of what were then considered subspecies—*B. p. poensis* and *B. p. vosseleri*. Both considered the Usambara population as an ‘incipient’ species. White (1974), who had heard the calls of both forms, thought that *vosseleri* was significantly different. Subsequently *vosseleri* has been recognized as a full species by Collar & Stuart (1985), Turner *et al.* (1991) and Sibley & Monroe (1993).

Recent records

There have been a considerable number of recent records which indicate that the range,

and thus the population of the species may be considerably larger than previously thought. They are listed below, along with a description of the bird's suspected call.

1990 a call believed to belong to this species (see below) was tape-recorded at 850 m in submontane forest on Mt Mtai, in the northeast corner of the East Usambaras in July 1991 (Evans & Anderson 1992).

1991–1992 a single bird was seen on at least ten occasions from September 1991–March 1992 by Dr Alan Tye (pers. comm. 1992). It was seen by night along the road leading down from Amani, at around 850 m in submontane forest. It was often disturbed from the ground on the road, and flew off into the forest. The call has been heard on several occasions at a site on Monga Tea Estate at 950 m near Amani (pers. obs., A. Tye verbally 1992 and I. Robertson verbally 1992).

1992 one bird was mist-netted in lowland forest at 200 m altitude in Kambai Forest Reserve. This is apparently only the second adult ever caught in the wild (Collar & Stuart 1985). A call believed to be of this species was also heard throughout the study period—at Kwangumi Forest Reserve (up to three birds calling on most of the 23 nights spent at the site), Kambai Forest Reserve (one bird calling on one night), and at Segoma Forest Reserve (up to two birds calling on many nights). On the follow-up visit in 1993, single birds were heard in Kwangumi (October) and Kambai Forest Reserves (September–October) and more recordings were made. It is not known whether the lack of records from Kambai (Semdoe) Public Land and Marimba Forest Reserve represent genuine absence. No nocturnal surveys were performed at Mtapwa, the sixth study site. The recordings have been deposited at the British Library of Wildlife Sounds in London.

Call

The call in question is a low-pitched, slow 'wubbering' note—*wb-a-wb-a-wb-a-wb-a* with the "a" comparatively weak, of 3–4 s duration, sometimes longer. Bursts were repeated at intervals of up to a few minutes for long periods. It was reminiscent to at least one observer of the drumming sound produced by displaying Eurasian Snipe *Gallinago gallinago*. It is similar in quality to the call of Fraser's Eagle Owl given on Chappuis (1978) but distinct in pattern. It is deep, far-carrying and very difficult to locate. It was only ever heard after dark, between 20:00 and 04:30, never at dusk or dawn. There must remain a small degree of doubt that the call is of this species until a calling bird is seen and tape-recorded simultaneously.

Biometrics

Of the four individuals from London Zoo mentioned by Olney (1984), two were still alive in 1992. Both were males. Several attempts were made to induce them to call by playing a recording of Fraser's Eagle Owl, but without success. Their keepers had not heard them call for many years (P. J. Olney *in litt.* 1992). In 1992, both birds were measured and photographed, and the results are given below. Both birds have now died and have been sent to the British Museum (Natural History) at Tring, where they are the only specimens of *B. vosseleri*. There are very few published biometrics from the Usambara population.

There is an unlabelled skin of a young Eagle Owl *Bubo* sp. at the Zoo which the keeper of the collection thought might have been *B. vosseleri*. This is unlikely as no young *vosseleri* have died at the Zoo (Olney 1984).

Table 2. *Biometrics of Usambara Eagle Owls Bubo vosseleri*

Individual	weight (g)	wing (mm)	tail (mm)	bill to cere (mm)	bill to skull (mm)	tarsus (mm)	wing moult
Kambai Forest Reserve	770	331	176	29	—	51	no
London Zoo male B804	850	>318	177	30	48	—	yes
London Zoo male B805	875	365	189	32	45	c. 60	no

Conservation status

The record from Mt Mtai was the first in the East Usamabaras away from the main plateau around Amani and confirmed that the bird was likely to be found at suitable altitudes on all the outlying mountains—Mt Mtai, Mt Mhinduro, Mt Mlinga and Mt Nilo.

These are the first ever records from the lowlands (at least seven birds are thought to have been located in 1992) and suggest that the species may be commoner there than in submontane forest, where, despite the far better coverage, few records are known (see above). Moreau (1964) speculated that this might be so, since Fraser's Eagle Owl is a lowland forest species. It is not yet known whether the species occurs in the lowland forests on steeper slopes at 400–800 m, or in the drier forest types in the lowlands (e.g., at Kambai (Semdoo) Public Land), and it has not been shown to breed in the lowlands.

It still merits its threatened status, given its (presumably) low population density and the destructive pressure forest is under at all altitudes in the Usambaras. However, it is clearly in less danger than was once thought. It is thought to tolerate some forms of forest degradation, as most of the breeding records are of chicks found in cardamom plantations, under a forest canopy, having fallen from their nest-holes (Olney 1984).

East Coast Akalat *Sheppardia gunningi*

Recent records

East Coast Akalats were found at all of the six study sites, in five separate blocks of lowland forest. Forty-four were mist-netted (out of 512 individual birds netted in total), making it the second commonest species caught. They were not previously known from the Usambaras, though there are populations in nearby areas of Kenya and Tanzania (Collar & Stuart 1985).

The forests varied fairly widely in structure, wetness and degree of human disturbance. Akalats were found in the full range of habitats—in tall, little disturbed forest (e.g., parts of Marimba, Kwamgumi and Segoma Forest Reserves) in logged forest with heavily disturbed understorey and many rocky outcrops (Kambai Forest Reserve) and in heavily disturbed evergreen thicket (e.g., Mtapwa Public Land and

parts of Kambai (Semdoo) Public Land). They seemed to occur at comparatively low densities in Kambai Forest Reserve and Kambai (Semdoo) Public Land.

They were mostly seen on the ground or up to 1 m up in low bushes, and only once 3 m off the ground in a thicket. They occurred in the same areas of forest, and at a similar level in the vegetation as Swynnerton's Forest Robin *Swynnertonia swynnertoni* (fairly common at the study sites (Cambridge Tanzania Rainforest Project in prep.)), White-starred Forest Robin *Pogonocichla stellata*, Red-capped Robin Chat *Cossypha natalensis*, White-chested Alethe *Alethe fuelleborni* and Red-tailed Ant Thrush *Neocossyphus rufus*. Three individuals were seen in Mtapwa in a single day, all associated with swarms of army ants, but none were seen in parties of ant-following birds in the Sigi-Muse valley.

They have not been found at some other lowland sites in the Usambaras—namely Amani-East and Amani-Sigi Forest Reserves (Sclater & Moreau 1932–33, Moreau 1935, Moreau & Moreau 1937, Stuart 1983), the east slope of Mt Mtai (Evans & Anderson 1992) or Kwenhondwe Forest Reserve in the West Usambaras (Stuart 1983). The Akalats appear to avoid the steep slopes of the escarpment between 400 and 800 m where many of the studies listed above took place. The 1992 fieldwork was the first thorough survey with mist-nets of the gently-sloping forests below 400 m which may prove to be their preferred habitat.

There is a recent record from Zanzibar (Beentje 1991) which does not appear to have been widely publicized.

Plumage and biometrics

The birds appear to belong to the East African coastal race *sokokensis* (see description in Keith *et al.* 1992). Biometrics of the captured birds are summarized in Table 3. The distribution of winglengths was bimodal, presumably representing the smaller females and larger males (as in other populations, e.g., Maclean 1988). On this basis, the biometrics in the table are given separately for large and small birds. Range and arithmetic mean are given. Only two of the 42 adults examined appeared to have active brood patches, both birds falling in the smaller adult size class. Two well-grown immatures were caught. One adult had just completed its primary moult on 21 July.

Table 3. *Biometrics (mm) of East Coast Akalats from the East Usambaras. For samples over 2, range and arithmetic mean (in bold) are given*

	wing	bill	tarsus	tail
Large (males?)	70– 72.3 –77	14.5– 15 –15.5	21.5– 21.9 –23.5	50– 55.9 –60
<i>n</i>	25	8	8	25
Small (females?)	63– 66.1 –68	14– 14.5 –15.5	20.5– 21.1 –22	47– 50.6 –55
<i>n</i>	17	10	10	17
Immatures	67–71	14.5	21.5	48–53
<i>n</i>	2	1	1	2

Conservation status

The population in the Usambaras is presumably quite large, though it has yet to be shown that the species breeds there. It is not in danger at the site in the short term, being protected by the extent of remaining forest, but habitat destruction is a threat in the longer term. It seems to be genuinely absent from many forests within its wide range, and those sites where it does occur are under severe human pressure (Collar & Stuart 1985). It was listed as globally threatened, status Rare, by Collar & Stuart (1985), and despite the discovery of several new populations, the vulnerability of its habitat suggests that it is still threatened. Considering the small size of the other main localities (Rondo 18 km² and Litipo, 10 km² (Bagger *et al.* 1990), Pugu 10 km² (Holsten *et al.* 1991) and Kazimzumbwe c. 20 km² (Huxham *et al.* undated)) the Usambaras probably hold the largest and most secure population in Tanzania.

Acknowledgements

We would like to thank the sponsors and advisors of the 1992–1993 project, in particular Dr Neil Burgess, Neil and Liz Baker, Dr Alan Tye, Phil Clarke and our two co-workers, Aidano Makange and Mathias Hague. Dr Leon Bennun, Peter Colston, Dr Gary Allport and Norbert Cordeiro all helped us to find specimens and photographs for comparison. The staff of London Zoo and the British Museum (Natural History) allowed access to captive birds and skins. Iain Robertson, Alan Tye and Munir Virani were kind enough to allow the inclusion of their records in this paper.

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Short communications

Roseate Terns *Sterna dougallii* breeding on Zanzibar

While visiting Chumbe Island, south of Zanzibar town from 19 to 21 July 1994, I noticed terns visiting the two small islets about 200 m off the southwest of the main island. The birds were Roseate Terns *Sterna dougallii* and appeared to be breeding.

The islets are about 5 m high and are joined to Chumbe at low tide. They consist of coral rag, one almost devoid of vegetation, the more northerly one having some scrub and herbaceous plant growth. Each is about 20 x 7 m with a reasonable overhang caused by wave action. I visited the the furthest islet with six students at high tide but found the boat movement and dangerous coral rag too difficult. On the next day at 09:00 we walked to the islets and were able to climb a ladder to within a metre of the top. The top of the islet had weathered into sharp ridges of coral rag. The terns' nests were in crevices between the ridges; some had sparse nesting material (grass) while others had no material at all. Most nests contained one egg and about three in 20 had two. Most were dirty and often bleached indicating that they were 'hard sat'. Although we had no measuring instruments we considered that there were an average of seven nests per square metre. Allowing for some dead brushwood at the north end which was not used by the terns, and sparser areas along the edge, we estimated between 500 and 700 nests. The number of birds flying around supported this estimate.

No other species of tern or other bird was present but the colony was visited two or three times a day by six Indian House Crows *Corvus splendens* and once or twice a day by a single Fish Eagle *Haliaeetus vocifer*. These visitors caused consternation amongst the terns although we found little evidence of destroyed eggs and very few nests were empty. One adult tern was found newly dead with its head caught between branches of the dead brushwood. The other islet with more vegetation (which was not visited) had a smaller number of breeding pairs, perhaps less than 50.

Pakenham (1979) noted that the Roseate Tern "Irregularly visits the islands to breed." and mentioned that Vaughan recorded breeding—but gave no numbers—on isolated rocks off the west coasts of Zanzibar and Pemba in July and August. This was probably in the 1930s. In East Africa as a whole, the Roseate Tern is the most numerous and widespread breeding larid, between June and August (Britton & Brown 1974). However, as far as I know, these are the first breeding records for Zanzibar since those of Vaughan.

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First East African nesting record for the Barred Owlet *Glaucidium capense* from Galana, Coast Province, Kenya

The Barred Owlet *Glaucidium capense schlefferi* is uncommon in dense habitat in eastern Kenya (Lewis & Pomeroy 1989), but more widespread throughout central and southern Tanzania (Fry *et al.* 1988). The only breeding records for East Africa concern a bird in breeding condition on Mafia Island (Tanzania) in September (Mackworth-Praed & Grant 1952), and adults with three flying young in January 1974 (Matzke & Matzke 1974). Despite its loud calls, and a degree of daytime activity, the species' overall shy and retiring habits probably account for the lack of records.

On 11 December 1991, we followed up a report of a breeding Sokoke Scops Owl *Otus ireneae* (whose nest and eggs are unknown, Brown & Britton 1980) at a site inland from Arabuko-Sokoke Forest, Kenya. We drove c. 40 km from the village of Jilore towards Tsavo National Park (East), leaving the main Sala Gate road at 28 km and heading towards the Galana River. The actual site lies west of Baricho, but not as far as Chakama, about 3 km from the river at approximately 3°10S, 39°40E.

In an area of mixed bush and newly settled *shamba*, we found a *Cynometra webberi* tree standing as part of a dense thicket hedge bordering a small farm settlement. The tree stood approximately 5 m tall, but had been partially destroyed for fuelwood (several limbs had been removed). The owner assured us he had stopped cutting on finding nesting activity the previous year, and the cuts in the limbs were definitely old.

On inspecting the tree more closely, we flushed a Barred Owlet from a hole. It flew to a neighbouring tree in which we then discovered a second bird at rest in deep shade. Fearing any attempt to climb the tree would damage it further, we set up a step ladder alongside, and managed to see into the nest from above. With the aid of a torch we were able to see two rather oval white or white-grey eggs resting on a floor of what looked like dried leaf fragments, including some broken palm frond. The eggs were resting about 1 m below the point where we could see into the nest, and could not be reached for measuring.

After a few minutes, we retreated to watch the owlet re-enter the nest through a hollow side limb stump at 3 m, leading to the floor of the nest chamber at around 2.5 m. It had flushed from a separate bolt hole, and there appeared to be a total of four entrances through which the owlets could reach the hollow tree interior. An inspection of holes at the base of the tree revealed that a lot of plant matter had been used to fill the hole below the nest by the owlets or previous inhabitants. The tree trunk was well covered with climbing plants. Eggs in early December accord well with the other records of breeding condition in September and young flying in January, and confirm the suggestion that egg-laying takes place in November (Brown & Britton 1980).

Although the nearest building was only about 20 m from the nest, the birds did not appear to be alarmed by normal human activity and sat tight unless the tree was approached directly. They also allowed close approach to the tree to which they were flushed, suggesting that they would not desert the area if similar levels of disturbance continued. The *shamba* owner assured us that he would continue to protect the nest.

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Scopus 18: 49–50, November 1994

Received 2 January 1994

Notes and new distribution records of the Quail Plover *Ortyxelos meiffreni*

Britton (1980) gives the distribution of the Quail Plover *Ortyxelos meiffreni* in southeastern Kenya as occurring in Tsavo National Park (East) in all months of the year. Urban *et al.* (1986) give a less specific locality, but confirm its regular presence in southeastern Kenya.

Between March and November 1991 Susan Stolberger and I made 27 sightings of this species from three pairs that appeared resident along a 3-km stretch of road near Kitani, in Tsavo National Park (West) at 3°00S, 37°59E. In April the same year I collected a specimen (to be lodged in the National Museum, Nairobi) in breeding condition in the park 15 km northwest of Kitani. We made a further sighting some 20 km southwest of Kitani in September 1991.

On 9 October 1993 SS and I saw a female crossing a road 23 km from Kuro on the road to Loiboseret in the Tarangire National Park, Tanzania at c. 4°S, 36°E.

All the sightings in Tsavo West and the single observation in Tarangire were on red soil where there was *Aristida* grass in acacia woodland. The sighting southwest of Kitani was in *Acacia-Commiphora* thicket, denser than all the other habitats.

We noticed a very characteristic gait during many of our observations. Reminiscent of the hesitant manner in which a chameleon rocks its body forwards and backwards as it progresses, we dubbed it the 'chameleon walk'. On another occasion my eye was caught by movement under a small *Solanum* bush that initially gave the impression of a leaf moving in a slight wind. On looking closer, we saw that it was a Quail Plover, rocking gently as it stood in a particularly effective exhibition of crypsis.

We also observed a Quail Plover dust bathing. Instead of lowering itself gently into the centre of the 'bath', it stood at the edge and threw itself sideways landing on its

right side in the centre of the 'bath'. It then righted itself and briefly dust-bathed conventionally with much feather-fluffing and scratching. It then stood up, moved to the edge of the 'bath', and again threw itself at the middle, landing on its right side, repeating the process of then righting itself and dust-bathing conventionally.

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Scopus 18: 51–51, November 1994

Received 29 November 1993

Hide and seek: Striped-cheeked Greenbul *Andropadus milanjensis* opportunistically encounters and feeds on a chameleon

Studies indicate that most greenbul species retain mixed diets of invertebrates and fruits although the degree of variation between species appears to be large (e.g., Keith *et al.* 1992, L. Dinesen pers. comm.). A few species of the family Pycnonotidae have also been known to take small lizards, geckos and frogs (e.g., Keith *et al.* 1992, Maclean 1988). There has apparently been no report of the Striped-cheeked Greenbul *Andropadus milanjensis* feeding on vertebrates and it is therefore of interest to document one such case here.

The following observations were made during a survey of the avifauna of Kindoroko Forest Reserve in the North Pare Mountains, Tanzania (Cordeiro in prep.). The area in which the actual observations were made was at 1600 m, about 25 m inside mature montane forest dominated by *Newtonia buchananii* stands.

At 16:05 on 21 July 1993, four Olive Mountain Greenbuls *Phyllastrephus placidus* and one *A. milanjensis* diverged from their mixed feeding party and flew into the canopy of a *Newtonia* tree. *P. placidus* individuals foraged for invertebrates on the bark and amongst the foliage and branches. The *A. milanjensis* followed the party shortly after and flew into the foliage of a hanging climber on the same tree, about 12 m above the ground. At about 16:10 it had begun to glean actively amongst the leaves when it appeared to be surprised by a puffed-up chameleon, c. 4–5 cm long, possibly of the genus *Rhampholeon*. It immediately attacked the reptile with its beak for several seconds, swallowed it whole, and then flew off to join the other greenbuls in the canopy.

Most reports on the feeding ecology of *A. milanjensis* indicate that it has a mixed diet consisting of fruits, seeds, and invertebrates (Belcher 1930, Mackworth-Praed & Grant 1960, Maclean 1988, Dowsett-Lemaire 1988, 1989, Keith *et al.* 1992, L. Dinesen pers. comm.) although Stuart (1983) categorizes it as a frugivore. My observations suggest that this greenbul also feeds opportunistically on larger and more difficult prey.

Acknowledgements

I am grateful to COSTEC and the Kilimanjaro Regional and District Officers for permission to conduct this study and to the Royal Society for the Protection of Birds and the Wildlife Conservation Society of Tanzania for providing financial support. Many thanks to Dr N. Burgess, N. and E. Baker, Prof K. M. Howell, P. Nyiti, J. T. Mushi and E. Tarimo for their help on this project. I also thank L. Dinesen for unpublished observations on greenbul ecology and T. D. Evans and L. Watson for comments on an earlier draft.

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Scopus 18: 51–52, November 1994

Received 7 December 1993

Further sightings of an unnamed cliff swallow *Hirundo* sp. in Ethiopia

We watched up to 12 cliff swallows for half an hour from about 09:30 on 18 September 1993, feeding along the western cliff faces of the small gorge running north from the main Awash river gorge, immediately adjacent to Kereyou Lodge, Awash National Park, Ethiopia (8°53'N, 40°06'E). Although they were typically observed flying below the rim of the gorge, they were also noted occasionally moving up as far as the grassland and scrub beyond the rim and, much less frequently, joining the more numerous Eurasian *Hirundo rustica*, Striped *H. abyssinica*, and Red-rumped Swallows *H. daurica*, in the airspace above. African Rock Martins *H. fuligula*, occasional House Martins *Delichon urbica*, Sand Martins *Riparia riparia* and Alpine Swifts *Apus melba*, were also seen for comparison.

General impression

A dark hirundine with pale underparts and pale rufous rump. Smaller than Striped Swallow with more triangular wings and short notched tail. Flight very martin-like with periods of gliding, sharp turns and fluttering along a relatively short flight path. This contrasted with longer, steadier, sweeping glides of the other swallow species. Although we watched them for half an hour with 7 x 42 and 10 x 40 binoculars, they

never came closer than 30 m and were often 50 m or more away. We looked for them again on 19 September 1993 at the same point, but they were not present. The following is a detailed description.

Upperparts

Head, neck, wings, mantle and tail dark blue-black, not as dark as *Delichon urbica* but darker than all the *Hirundo* species present. Some birds were duller, perhaps browner. There was no obvious iridescence. Rump square and variable in colour ranging from buffy cream to pale rufous. Possibly the duller-backed birds had the paler rumps. Certainly this variation was not a factor of light. No pale mirror spots on the tail.

Underparts

Extensive dark cheeks and dark sides of neck extending well down, thereby restricting whitish throat to a narrow but noticeable central area. Rest of underparts dirty white, possibly with a buffy tinge. Underwings not well seen. Flight feathers certainly dark underneath. Coverts perhaps paler but overall affect much darker than *H. abyssinica*.

Discussion

The birds were clearly cliff swallows of the same species recorded from Awash National Park by Madge & Redman (1989) and hitherto unrecorded in Ethiopia (Urban & Brown 1971). We agree with Madge and Redman that they appear not to be Red Sea Swallow *H. perditia*. The type specimen of this species is described as showing a bluish-black throat and upper breast with a pale chin spot. It also had a grey rump (Turner & Rose 1989). These characters were absent on the birds we saw. The birds we observed are, in fact, most like the South Africa Cliff Swallow *H. spilodera*, from which they differ in the lack of black breast markings, apparent lack of rufous on forehead and lores and in having a blacker crown and nape (Maclean 1984).

Subsequent observations

A group of cliff swallows of the same species was also watched for about 5 min from about 13:00 on 25 September 1994 by the authors and J. Harjula, flying along the inner rim of the northern wall of the crater of Fantalle Mountain, some 25 km from the sighting at Kereyou Lodge (9°00'N, 39°54'E). The birds were observed alongside two Red-rumped Swallows. Interestingly, both the Red-rumped and the cliff swallows exhibited very pale buff to off-white rumps, though the cliff swallows were readily distinguishable by their flight pattern, the absence of a chestnut nape, dark cheeks and sides of throat, lack of tail-streamers and much smaller size. It is worth noting here that numbers (up to 20) of very pale-rumped Red-rumped Swallows of unknown origin were also seen from the same site on Fantalle Mountain and at the Kereyou Lodge gorge in September 1993. The origin of these birds would be interesting to establish.

The dates of observation—19 September 1993 and 25 September 1994—extend the period when this species has been recorded in Ethiopia by two months. JDA has checked the area up to 25 times on different dates covering most months from 1991 to 1994, but has had no other sightings. The other site from which the species is known, at the south end of Lake Langano (7°35'N, 38°45'E) in the Rift Valley, has also been frequently checked by JDA, Per Ole Syvertsen and others, but without success.

There have been two other sightings of individual hirundines identified as cliff swallows, probably of this species, elsewhere in Ethiopia: one near Gibe over grassland not far from the Gibe river gorge on 18 October 1993 (JDA), the other from near Jimma on 24 March 1994 (J. Harjula, pers. comm.).

Observers visiting Ethiopia should certainly be alert for cliff swallows in any apparently suitable habitat: gorges and cliffs with nearby water and grassland, particularly in the central and northern parts of the Rift Valley and apparently usually with other hirundines.

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Scopus 18: 52–54, November 1994

Received 17 October 1994

An isolated population of the Olive-bellied Sunbird *Nectarinia chloropygia* in Ethiopia

The Tepi–Mizan Teferi forests of South-West Ethiopia are poorly known ornithologically. During a visit there from 12–16 February 1993, I found sunbirds with olive bellies in two localities near Tepi (7°12'N, 35°25'E). There was a male in secondary forest growth at c. 1200 m on 14 February near Gezmaret (7°07'N, 35°26'E) along the Tepi–Mizan road. Later that day there was a possible male at Tepi airstrip (7°12'N, 35°25'E) at c. 1250 m. On 16 February there was a male with a female close to the site of the bird seen two days earlier. These birds were eventually identified unquestionably as Olive-bellied Sunbirds *Nectarinia chloropygia*.

In appearance the males were reminiscent of Eastern Double-collared Sunbirds *N. mediocris*, with a distinctive olive/yellow-olive belly, but they had the straighter bill typical of *N. chloropygia* and the upper tail-coverts were green rather than metallic blue. The female had noticeable streaking on the chest. The first bird was in secondary growth at the forest edge, and the others in neglected cultivation with rank grasses, immediately adjacent on one side to the airstrip and on the other to degraded forest/secondary forest growth. The habitat and altitude at which these birds occurred match the habitat preferences (forest edges, moist bushland, secondary growth) and known altitude preferences indicated in Britton *et al.* (1980), Lewis & Pomeroy (1988) and Williams & Arnott (1980) for *N. chloropygia*.

Although *N. mediocris* could occur in Ethiopia, it is typically a species of higher elevation than *N. chloropygia*, being found mainly above 1800 m in its known range in Kenya, though it does wander to lower levels. *N. chloropygia* typically occurs only between 1000 and 1750 m in Kenya. So far *N. chloropygia* is the only olive-bellied sunbird known to occur in Ethiopia (Urban & Brown 1971), whence there is only one other confirmed record: a male collected in 1901 near Tepi by Neumann (1905).

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Received 17 October 1994

Dr J. S. Ash comments:

This rediscovery of the Olive-bellied Sunbird *Nectarinia chloropygia* in South-West Ethiopia is of much interest. It is described as a very poorly known resident in the West Highlands by Urban & Brown (1971), but its inclusion in the avifauna of the country actually rests on a single confirmed male specimen collected at Datschabassa, Binescho (Kaffa), on 22 April 1901 (Neumann 1905). This became the type for a new subspecies *N. c. bineschensis*, which is regarded by White (1963) as being doubtfully distinct from *N. c. orphogaster* of southern Sudan and further south.

According to Neumann (1902), Binescho lies along the track from Shewa Gimirra (7°00'N, 35°50'E) to Shekho (= Sciacco) (7°03'N, 35°29'E). On my old map, at a point where I judged Binescho should lie, the name Biencio has been written in pencil—possibly by a previous Italian owner of the map who had travelled in that area. This lies at 7°02'N, 35°39'E, and if it is not Neumann's site it must be within a few kilometres of it and within the Ethiopian Mapping Scheme (EMS) square 80D. It is probably within 24 and 30 km from Atkins' two sites near Gezmarete and Tepi airstrip in EMS 80C. There are two other mentions of this species in Ethiopia: Beals (1970) refers to a pair nesting in July in *Euphorbia*–*Acacia* woodland at 9 km south of Langano (c. 7°27'N, 38°43'E) but he does not provide details of identification; and furthermore there have been no further records of the species in this, the most bird-watched area of Ethiopia, so the record should perhaps only be regarded as uncertain. Bolton (1973) mentions an uncertain observation in 1969 in EMS square 118B to the west of Lake Stephanie.

The existing certain records of this species from a restricted area add another species to the list of those having similarly local distribution elsewhere in Africa (e.g., Blue-breasted Kingfisher *Halcyon malimbica* (de Castro & de Castro 1990), Yellow-throated Leaf-love *Chlorocichla flavicollis* (Ash 1973)). The Ethiopian Olive-bellied

Sunbird population, according to present knowledge, is isolated from the nearest population in Sudan (Nikolaus 1987) by 700 km, and in Kenya (Lewis & Pomeroy 1989) by 650 km.

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Scopus 18: 54–56, November 1994

Received 17 October 1994

African *Pitta pitta angolensis* at Jadini, Kenya coast

On 17 October 1993 at around 15:30, while walking down a well trodden track near Nomads Beach Bar in the Jadini Forest on the southern Kenya coast (4°19'S, 39°34'E), I came across an adult African *Pitta pitta angolensis*. After watching the bird for 5 min, I left to fetch some more observers to share my sighting. On returning, we could not relocate the bird but, on playing a tape recording, it appeared from the undergrowth. We watched the bird well for a further 20 min in good light at a range of 3–8 m and made the following observations. The bird was immediately recognizable by its striking, colourful plumage. The back and mantle were dark green, contrasting sharply with a buff/yellow breast and a scarlet upper and lower belly. The sides of the head, nape and crown were black with a buff/yellow supercilium. The bill was heavy and the legs were set noticeably well back on the body. On playing the tape recording repeatedly, the bird came out on to the edge of the track, where it stood erect for several seconds before flying across, showing white patches on the primaries.

Unlike many descriptions in the literature, this bird was very obliging and appeared completely oblivious to our presence, allowing a close approach. It fed by standing still for up to 30 s, flicking leaves aside with its bill, before hopping a metre or so to another spot and repeating the process.

October is the tail-end month for the Pitta's occurrence in Kenya, and this bird was presumably about to migrate south to breed. A species more usually associated with Gedi and Sokoke to the north, this record appears to be the first in Kenya for about a decade (Waiyaki, 1994), possibly due to a decrease in the breeding population in Mozambique combined with a lack of resident observers at the Kenya coast.

Reference

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James Bradley, Box 39814, Nairobi, Kenya

Scopus 18: 57, November 1994

Received 11 October 1994

Further records for the Taita Falcon *Falco fasciinucha* from Tanzania

The Taita Falcon was first collected from Tanzania by Gerd Heinrich at Kingolwira near Morogoro on 4 February 1962 (Ripley & Heinrich 1966). Previously it was known from sight records on Olosirwa in the Crater Highlands, probably during January 1945 (Elliott & Fuggles-Couchman 1948). The third and fourth records were of birds collected by Thorkild Andersen from Namabengo, some 30 km northwest of Songea: a male on 29 May 1964 and a female on 16 November 1964 (Britton 1981). The fifth record was that of Geertsema (1977) from the Gol Mountains, west of the Crater Highlands, on 1 March 1977. We can now give three further Tanzanian records of this enigmatic falcon.

On 31 October 1983, near Njombe in the Southern Highlands, EMB watched a perched adult for several minutes in good light at 09:45. The large feet, short tail and distinctive nape patches were noted.

On 22 December 1989, some 30 km northeast of Kilosa along the road to Dumila to the west of Morogoro town, and only 65 km from Kingolwira, we saw an adult flying along a local storm front. It was well seen against dark clouds (with the light behind us). The short tail, heavy head and pale rufous wash to the underparts were clearly seen several times.

On 1 December 1993 we had excellent brief views of a Taita Falcon from the track which crosses the Ukaguru Mountains east of Mamwera peak. It was immediately identified on jizz—the large head and short tail being particularly distinctive. The strong morning light highlighted the pale throat and upper breast as the bird flew virtually overhead above the pass. This record is only 40 km from the December 1989 sighting and 106 km from Kingolwira. There are many isolated crags and rock faces in

the surrounding hills and mountains and an abundance of small passerines on the Mkata Plain throughout the year.

It is, we think, reasonable to assume that a population of Taita Falcons is resident in the area but further records during other months are required to confirm this.

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N. E. Baker and E. M. Baker, Box 23404, Dar es Salaam, Tanzania

Scopus 18: 57–58, November 1994

Received 2 March 1994

The status of the Red-faced Mousebird *Urocolius indicus* in Tanzania

With the revision of *Birds of East Africa* (Britton 1980) in hand, I would like to draw attention to a number of references to Tanzania which require clarification. A particular one which has surfaced several times is the distribution of the Red-faced Mousebird *Urocolius indicus*. Britton (1980) states that “there are good sight records from Ruaha National Park presumably referable to [the race] *mossambicus*.” The only published reference for Ruaha NP that I can trace is in the list in Williams (1981) which includes both Blue-naped *U. macrourus* and Red-faced Mousebirds. However, these lists were not intended as sources of primary reference and contain species the author felt *should* occur (J. G. Williams, pers. comm.). The sympatry of the two species has also been questioned (H. Schifter, pers. comm.).

Vesey-Fitzgerald & Beesley (1960) record only Blue-naped for Lake Rukwa, and Procter (1968) lists only Blue-naped and Speckled *Colius striatus* for the Usangu Flats. These areas, south and southwest of Ruaha NP, form an ecological barrier to the population of *U. indicus* from extreme southwestern Tanzania. The Tanzania Atlas data base contains no records of *U. indicus* from this area and I suspect that the sightings of Red-faced actually refer to Blue-naped when the blue of the nape was not seen.

Ulfstrand (1975) refers only to Red-faced for the Mtera basin downstream from Ruaha NP, but more recent visits by J.S.S. Beesley in 1981, 1982 and Baker & Baker (in press) found only Blue-naped.

If any readers have records or references for either species for Ruaha NP I would much appreciate hearing from them.

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Scopus 18: 58–59

Received 14 June 1994

Common Bulbul *Pycnonotus barbatus* with a white eye-ring from the Kerio Valley, Kenya

On 8 December 1989 at the base of the Elgeyo Escarpment in the northern Kerio Valley (0°20'N, 35°40' E) I saw a Common Bulbul *Pycnonotus barbatus* being much harassed by others of the same species. On closer examination, I saw that the bird had a white base to the bill and prominent white eye-rings on both sides of the head (type 1, Table 1). Apart from these obvious differences and a more skulking nature, the bird



was otherwise a typical *P. barbatus*. Although similar to the southwest Asian race *P. b. xanthopygos*, the eye-ring was markedly wider, being estimated at 2 mm wide. Two weeks later a presumed second bird was seen (type 2a). Although this was regularly seen during 1990, type 1 was not seen again until 1992, so it could not be certain whether two birds were involved.

Neither bird was recorded during 1991 but during 1992, however, a bird of type 1 appeared regularly and was photographed (Fig. 1). In March 1992, birds of types 1 and 2a were recorded, confirming that there were at least two bulbuls with white eye-rings.

Figure 1. Common Bulbul *Pycnonotus barbatus* of type 1 (Photo: N. Wilson)

Table 1. *Categories of Common Bulbuls with white-eye rings in the Kerio Valley*

Type	description	No. seen
1.	White at base of bill and heavy continuous 2-mm eye-ring on both sides	4
2.	White at base of bill and partial heavy eye-ring:	
	2a Complete left, discontinuous right	1
	2b Complete right, discontinuous left	1
	2c 'Half moon' behind both eyes	1
	2d Partial right, none left	2
	2e Partial left, none right	1
3.	White at base of bill and continuous feint white eye-ring on both sides	1
4.	White at base of bill only	3

All the birds were seen in mid-May 1993 apart from type 2c which was recorded on 1 June 1993. None have been noted from outside the area, being confined initially to about 50 ha at 1500 m. The birds dispersed at the onset of the rains, presumably to breed.

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Scopus 18: 59–60, November 1994

Received 16 July 1993

Description of the nest and eggs of the Lead-coloured Flycatcher *Myioparus plumbeus* from the Kerio Valley, Kenya

Myioparus plumbeus is described as local and uncommon in woodland, wooded grassland, scattered thickets, moist bushland and forest edges up to 2000 m (Britton 1980). Brown & Britton's (1980) only record for the species is of nest building in April in their Region B.

On 19 April 1992 at Lake Kamnorok (0°39N, 35°37E) we saw a pair of *M. plumbeus* carrying fine grass to a west-facing hole in a dead tree about 5 m above the water. Because of flooding, we were unable to reach the tree to make further investigations. Then on 12 March 1993, in an exotic plantation area at 1450 m (0°20N, 35°40E) we saw a pair of the same species taking nesting material to a former Nubian Woodpecker *Campethera nubica* nest hole in a telegraph pole 5½ m above the ground. We were able to watch this site and the birds began incubating on about 19 March leaving the west-facing hole unattended during the heat of each afternoon. We recorded the nest and egg details given below on 23 March.

The entrance hole was 6 cm in diameter with the nest rim 2.5 cm below. The cup-shaped nest itself was 6 cm in internal diameter and 2.5 cm deep, scantily made from fine interwoven grass and lined with dried bougainvillea flowers and small feathers. The two eggs were pale sea-green, heavily marked all over with dark olive-green streaks and spots, more concentrated at the larger end. They measured 17 x 12.5 mm.

In South Africa, Maclean (1985) describes the eggs as being dull white or greenish white spotted with olive-brown and greyish brown while Mackworth-Praed & Grant (1960) describe them as dull white or whitish green spotted and blotched with various shades of brown.

On 3 April one of the birds was taken by a Little Sparrowhawk *Accipiter minullus* and the nest was deserted until 14 April when what was presumably the remaining bird was seen clearing nesting material from the hole. On 25 April a Brown Parrot *Poicephalus meyeri* was also seen removing nesting material. However, on 2 May a pair of *M. plumbeus* were once again seen carrying material to the nest site and, although one adult was occasionally seen sitting on the nest between 14 and 20 May, breeding was not successful.

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Scopus 18: 60–61, November 1994

Received 16 July 1993

Woodpecker feeding immature honeyguide

On 8 August 1993, G. Davey, T. Davidson and I were bird watching in a patch of groundwater forest some 2 km east of the Masai Mara Game Reserve's Musiara Gate in southwestern Kenya. We watched a pair of Bearded Woodpeckers *Thripis namaquus* foraging. The female collected a bill-full of insects and flew into the canopy of a nearby *Euclea* tree, closely followed by a Scaly-throated honeyguide *Indicator variegatus*. From its very pale underside, it was judged to be an immature. Perching near the woodpecker, the honeyguide begged with wing-fluttering and open bill. The woodpecker immediately fed its load of insects into the honeyguide's gape and left in search of more. The feeding was repeated three times in 15 min.

This record suggests that *Thripis namaquus* is a nest host for *Indicator variegatus*, and confirms that the fledgling honeyguide is fed after it has left the host's nest hole. Other potential hosts for honeyguides seen in the same patch of forest at the same time included Spotted-flanked Barbets *Lybius lacrymosus*, Grey Woodpecker *Mesopicos goertae* and Lilac-breasted Roller *Coracias caudata*.

Peter Davey, Box 41822, Nairobi, Kenya

Scopus 18: 61, November 1994

Received 12 August 1993

Egyptian Vulture *Neophron percnopterus* behaviour

At an isolated spring below Emarti Hill in Masai Mara Game Reserve, Kenya on 19 October 1993, I watched the following behaviour by a pair of Egyptian Vultures *Neophron percnopterus*.

One of the birds (which later proved to be the female) sat on the ground, eyes partly closed, as if resting. The male (cere orange rather than yellow) repeatedly picked up grey hair-like material which I later identified as regurgitated indigestible material from a small predator, possibly a jackal. The male carried this material in his beak and presented it to the female, touching her beak with the offering. After three attempts in which the female took no apparent notice, the male placed the material on the ground in front of her. She immediately picked it up, held it, and crouched down; then the male mounted her and copulation took place.

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Scopus 18: 62, November 1994

Received 8 November 1993

Uluguru Violet-backed Sunbirds *Anthreptes neglectus* at Tana, Kenya

The Uluguru Violet-backed Sunbird *Anthreptes neglectus* is one of Kenya's least recorded birds with only about six published sight or specimen records. Its known range extends from coastal northern Mozambique through eastern Tanzania to the coastal lowlands of Kenya (Britton 1980, Collar & Stuart 1985). In Kenya, however, it is only known from four sites: Makere West Forest on the lower Tana River, Shimba Hills, Buda Forest, and Jadini Forest (Lewis & Pomeroy 1989, Waiyaki & Bennun 1994).

During about 24 days in February, March and June 1994 I visited nearly all of the 55 or so riverine forest patches along the lower Tana River as part of an extensive survey of the region's endangered primates. Throughout the survey I searched for the rarer birds reported along this stretch of the river, particularly *A. neglectus* and the White-winged *Apalis Apalis chariessa*. The only previous record of *A. neglectus* in Tana River forests is of a female collected in Makere West Forest 32 years ago (Keith 1968).

On 19 February I had a brief but good (4 m distance) view of a female *A. neglectus* near the centre of Kitere Forest (165 m a.s.l.) in the Tana River Primate National Reserve. This is apparently only the second sighting of this sunbird north of Mombasa (i.e., Jadini Forest), and the first for this reserve. Kitere Forest is located about 10 km to the south of Makere West Forest. Both forests are on the west bank of the Tana.

I returned to Kitere Forest on 8 June and spent 3 h following a slow-moving, unusually large, bird party of at least 18 species:

Trumpeter Hornbill *Bycanistes bucinator*, Yellow-rumped Tinkerbird *Pogoniulus bilineatus*, Golden-tailed Woodpecker *Campethera abingoni*, Little Spotted Woodpecker *C. cailliautii*, Drongo *Dicrurus adsimilis*, Zanzibar Sombre Greenbul *Andropadus importunus*, Red-capped Robin Chat *Cossypha natalensis*, Red-tailed Ant Thrush *Neocossyphus rufus*, Black-

headed *Apalis Apalis melanocephala*, Black-throated Wattle-eye *Platysteira peltata*, Little Yellow Flycatcher *Erythrocerus holochlorus*, Paradise Flycatcher *Terpsiphone viridis*, Crested Flycatcher *Trochocercus cyanomelas*, Collared Sunbird *Anthreptes collaris*, Uluguru Violet-backed Sunbird *A. neglectus*, Dark-backed Weaver *Ploceus bicolor*.

In addition, there was one unidentified greenbul and one unidentified warbler. A male and female *A. neglectus* were present in the bird party.

Both *A. neglectus* were seen clearly in good light from 8–15 m on several occasions. They met the species' descriptions given by Mackworth-Praed & Grant (1960) and Williams & Arlott (1980) with the exception that I could not detect any green edging to the primaries and the female had but a trace of yellow on the abdomen (i.e., not bright yellow). The field character which most clearly differentiated both the male and female from the closely related eastern Violet-backed Sunbird *A. orientalis* was the greyish-brown underparts. *A. orientalis* has nearly pure white underparts. In addition, unlike the female *A. orientalis*, the female *A. neglectus* lacked the white streak above the eye.

Keith (1986) also remarked that the female *A. neglectus* he collected in Makere West Forest had reduced yellow below and less green on the wings. There may be some slight, but significant, phenotypic differences between the Tana birds and those from south of Mombasa. The subspecific status of the Tana birds needs investigation.

Throughout the 8 June encounter, the pair of *A. neglectus* were usually within a few metres of one another as they actively foraged for insects among the dense foliage of the outer branches of trees. They were generally 5–10 m above the ground but sometimes dropped to within 1 m. On one occasion the male and female sat side by side on a twig for about 5 min during which the female briefly preened the male.

Mackworth-Praed and Grant (1960) describe the call of *A. neglectus* as "a loud persistent squeak". This was not heard during the Tana encounters. Instead, what was heard often was the typical sunbird sharp *tsssp* given 1–4 times in succession. This call was sometimes followed immediately by a melodious 1-s long warbling trill. Thus, the call is quite different from those of the two more common sunbirds in the lower Tana forests, the Collared *A. collaris* and the Olive Sunbird *Nectarinia olivacea*. As such, the call should be a useful aid in locating the rather inconspicuous *A. neglectus*.

During the 3 h I was with the bird party, it moved about 120 m through evergreen forest where most trees were 10–30 m in height. As the party approached the extensive stand of phoenix palms *Phoenix reclinata* on the edge of the forest, the birds reversed direction and started to move back towards the centre of the forest. The more common tree species here were *Alangium salvifolium*, *Cordia ghoeztii*, *Ficus sycomorus*, *Oxystigma msao*, *Pachystela msolo* and *Sorindeia obtusifoliolata*. The lower vegetation was moderately dense and dominated by *Polysphaeria multiflora* and *P. reclinata*. Horizontal visibility at 2 m above ground was 3–15 m.

At Tana, as in other regions where *A. neglectus* and *A. orientalis* live in close proximity, *A. neglectus* is apparently a true forest bird whereas *A. orientalis* does not enter forest, being a species of more arid vegetation types such as bush and open woodland (Williams & Arlott 1980, Britton 1980, Lewis & Pomeroy 1989). There seems to be little habitat overlap between the two species.

Although Kitere Forest is approximately 18-ha in size, only about 4–5 ha is tall

evergreen forest and probably suitable habitat for *A. neglectus*. While this forest is protected within the reserve, there remains a moderate level of cutting of palm fronds, poles, firewood and canoe paddles by the local Pokomo. The presence here of two groups of Tana River Red Colobus *Colobus badius rufomitatus* and one group of Tana River Crested Mangabeys *Cercocebus g. galeritus*, both highly endangered, endemic primate subspecies, should help to ensure that this forest gets the protection and management it needs to survive into the foreseeable future.

Unfortunately, Makere West Forest, where Keith (1968) obtained the first and only other record for *A. neglectus* at Tana, is among the most damaged forests in the area. Makere West Forest is still about 48-ha in size but only a few hectares hold good high forest, the remainder being secondary forest and dense bush. Lying just north of the reserve, it is heavily exploited for poles and firewood, and a large portion of the original forested area has been cleared for agriculture. I made two brief visits to Makere West Forest but saw no *A. neglectus*. More work needs to be done to determine whether *A. neglectus* is still present in this forest.

While *A. neglectus* is certainly one of the rarer birds in the forests of the lower Tana River, it is also one that is easily overlooked. While forest loss in the region has been considerable during the last several decades, there remain more than 50 small (1–100 ha) to medium sized (100–1000 ha) evergreen forests. Much more research is needed to determine the status of *A. neglectus*, *Apalis chariessa* and other rare birds in these forests.

Acknowledgements

I wish to thank Zoo Atlanta, Kenya Wildlife Service, the National Museums of Kenya and the Kenya Institute of Primate Research for supporting my research at Tana River.

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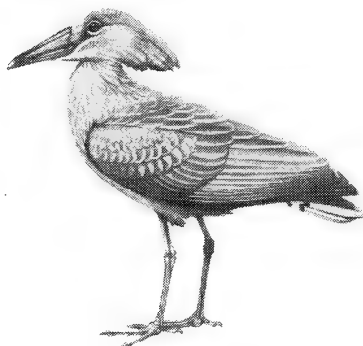
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A publication of the
Ornithological Sub-committee of the
East Africa Natural History Society

Edited by
Graeme Backhurst

Volume 18, No. 2, December 1994

SCOPUS

Cover illustration from a gouache painting by Dr P. A. Clancey

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Notes for Contributors

Scopus welcomes original contributions on all aspects of the ornithology of eastern Africa—the area from the Sudan south to Moçambique. Contributions will be assessed by independent referees. The material published is divided into 'papers', 'short communications', letters, and communications. Short communications will usually be less than two pages in length.

Authors are asked to follow the conventions used in *Scopus* and to refer to a recent issue for guidance. Metric units should be used. A few examples of conventions are: **dates:** 23 September 1991 [note the order, no comma, not '23rd']; **names of birds:** Cape Rook *Corvus capensis* [no comma, no parentheses, no author's name]; **list of**

Continued inside back cover

Avifauna of the southern Kerio Valley with emphasis on the area around the Kenya Fluorspar Mine site

August 1989–July 1993

N. Wilson and V. G. Wilson



This paper began as a bird list kept for personal interest but, when comparing the range of species with that given by Lewis & Pomeroy (1989), it became apparent that many of the records were new or updated former ones, so a brief survey of the total area was conducted. This initial census revealed further species' range extensions along with some interesting breeding data and it was decided to concentrate on the area over an extended period—eventually becoming four years. It was written to serve two purposes: as a guide to the species one could expect to observe within the area but, more importantly, since all mines have a finite life and are to some extent responsible for the variety of avifauna present (or absent) within their immediate vicinity, to serve as a reference for future comparison.

Most of the records were made during the five years 1989–1993 and are personal; reference is also made to other contributors and acknowledged as such. Three hundred and thirty-eight species were recorded for the total area during the 48-month survey, of which 25 appeared true montane endemics being found only above 2000 m, 108 were pluriregional and 205 confined to the low and intermediate region. Avifauna observed in Region A (see Figs 1 and 12), between 1250 m and 2000 m, is described from p. 73 and also includes species overflying. Region B is described on p. 96 and includes species seen above 2000 m. Descriptions are given for the area in which individual species were recorded together with habitat preferences and notes on breeding where appropriate. One species, the Common Bulbul *Pycnonotus barbatus*, but with a broad white eye-ring, believed to inhabit only a single 1-km square within the area (Wilson 1994), is given an updated status on p. 111.

Location

The study area contains the Kenya Fluorspar Company Limited (KFC) mine site (0° 20' N, 35° 40' E), and is situated 325 km by road northwest of Nairobi in the southern end of the Kerio Valley. The locality is readily accessible, being gained through Nyaru on the edge of the Elgeyo Escarpment at 2750 m, whence an all-weather murram road, 24 km in length, winds its way through Turesia Market to the valley floor and the village of Kimwarer below (Fig 1).

General description of the area

During the Post-Miocene era, tertiary lavas from local eruptions formed a protective cap of weather-resistant basalt and phonolites over the Precambrian rocks of the Mozambique system in the area. Subsequent faulting in a north–south direction resulted in the formation of the Kerio Valley and the 1500-m Elgeyo Escarpment, and later the Great Rift Valley. The entire geological succession, from Precambrian rocks to tertiary lavas, is exposed within the survey area. Later slumping of the escarpment

wall gave rise to an extremely fertile plateau at around 2000 m on which Turesia Market is now situated. This plateau is seen to act as a natural barrier between species regarded as montane and those of intermediate and lowland areas.

At its lowest level, the valley floor is characterized by *Acacia* savannah with scrubby grassland yielding to local riparian mixed woodland, often dense in places. At intermediate altitude, although mixed *Acacia* dominates the ecotone, ravine woodland becomes more evident. This intermediate region is essentially capped by the cultivated Turesia plateau where few mature trees remain but secondary tangled growth is common. The escarpment wall, which in places is almost vertical, suddenly terminates the *shamba* area and, adjacent to it, fragmented forest remnants cling to a precarious existence (see p. 112). At around 2600 m, bamboo becomes common as part of a mixed woodland and the summit of the escarpment is host to *Cupressus*. A more detailed description of the vegetation of the area is given at the beginning of the relevant sections.

Climate

Figures of monthly rainfall and average temperature, measured at 1400 m, were provided by the KFC laboratory and are given in Figs 2 and 3 respectively. Seasonal temperature showed little variation on the valley floor resulting in a standard deviation of 1.25 on the maximum and 0.79 on the minimum during the period. Records from the beginning of 1989 and for the end of 1993 have been included for reference. Total annual precipitation is also given in parentheses.

Because of the effective amphitheatre of hills to the north, south and west, the area is subject to a micro climate. The prevailing wind during the early rains is generally westerly during the day with the warm air of the valley being replaced by cooler air descending from the high land at night. Afternoon storms during this period usually cross the valley floor and ascend the escarpment only to remain there as the cooler night air reverses the direction of flow. For this reason, the escarpment can be relatively cold and wet for extended periods. Cloud often cloaks the escarpment in the early mornings and late afternoons, occasionally not clearing at all during the rains. In the late rains the prevailing wind is often from the west, precipitation occurring prior to cloud crossing the valley floor. A steep precipitation gradient therefore exists across the survey site with 1200 mm of annual rainfall quoted for the extreme east and 1600 mm for the west (Fig 13). Humidity is generally high with evaporation rates at low altitude of between 1550 mm and 2200 mm annually (Capon 1985), but as high as 200 mm per month has been recorded. A temperature gradient of around 5°C occurs between the valley floor and escarpment, although during the coldest months, freezing at the highest altitudes is not unknown.

The usually accepted rainfall periods for the year are March to June and June to October—Zone 2 of Griffiths (1958)—with an average 60 per cent of precipitation occurring in the latter period. During the survey the actual pattern did not conform to the accepted norm and, as can be seen from the mean rainfall figures (Fig 3), the rains comprise two seasons with 60 per cent of precipitation during the early period,

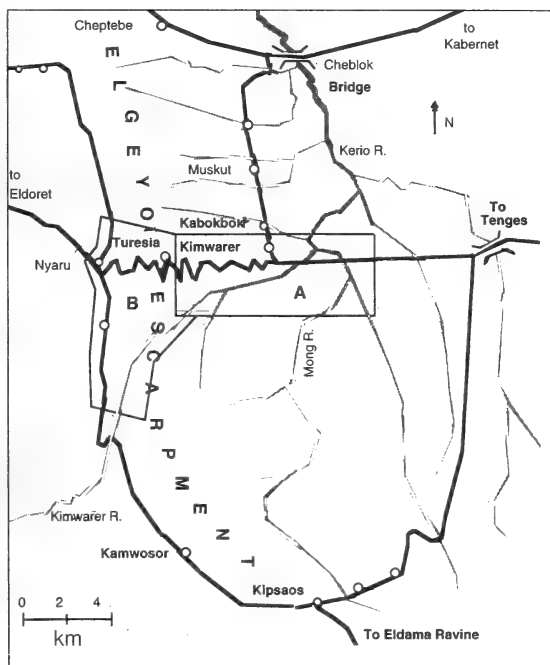


Figure 1. Location of survey area

generally diminishing during August. The late rains are short in comparison, only lasting through October and November annually. February is generally accepted as the driest month but, as Fig 3 shows, this only occurred during 1991.

Although the Kimwarer and Mong Rivers had been known to dry up (most recently in February–March 1988), both proved permanent throughout the survey period.

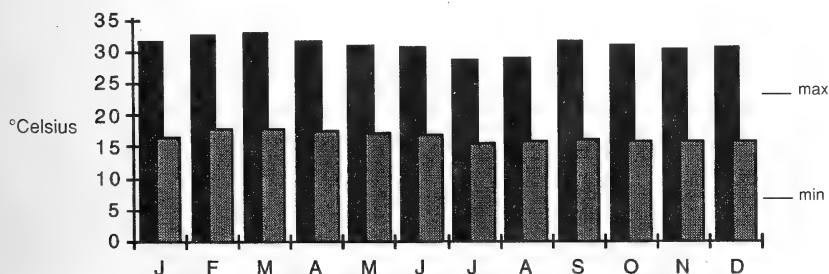


Figure 2. Mean temperature (°C) recorded at 1400 m, 1989–1993

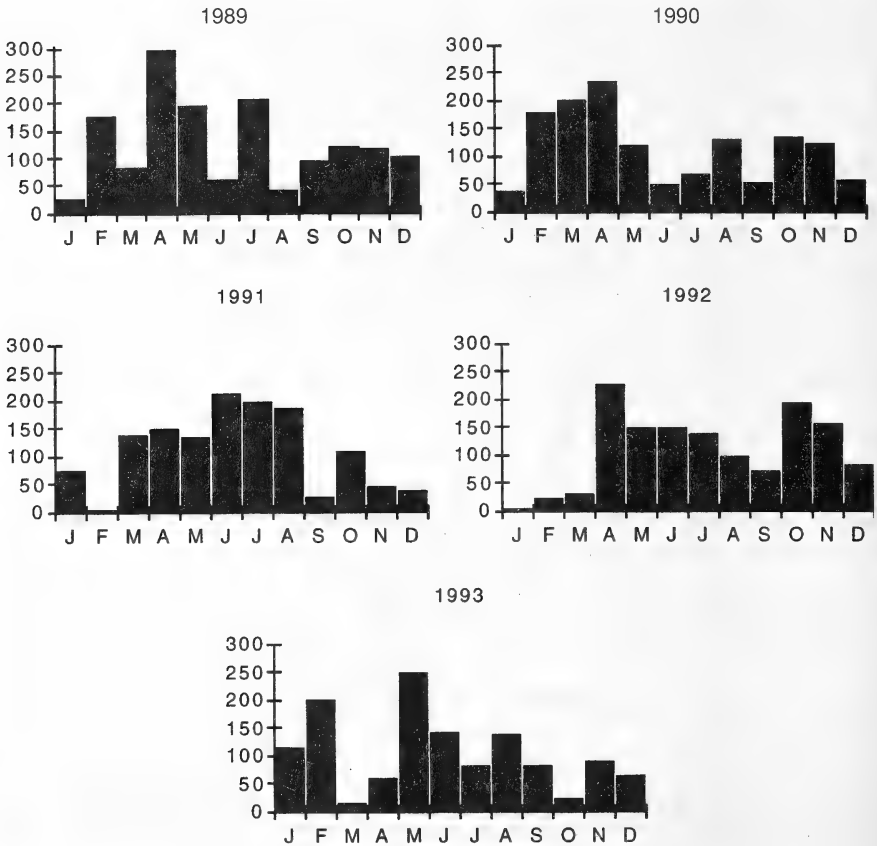


Figure 3. Annual rainfall totals (mm) 1989–1993

Field Coverage

In excess of 3000 man-hours of observation were made throughout the 48-month survey period. Even so, with an area covering 60 km², not all regions could be visited with the same frequency. To reduce bias, diverse habitat representing each altitude range was surveyed at regular monthly intervals. Observation was usually between 6:30 and 10:00 and between 17:30 and 18:30. Late evening visits were made to likely owl and nightjar areas. Avifauna presence was recorded both on sight and, where positive identification could be made, on voice too. Any species overflying the area were also noted and are stated as such under 'Species accounts'.

Some sample bias inevitably occurred and further observation of the denser



Figure 4. *Turesia plateau with recent rock fall on the escarpment*



Figure 5. *Turesia plateau and escarpment*



Figure 6. *Escarpment from the staff housing area*



Figure 7. *View looking west from tailings lagoons with mine site on the right*

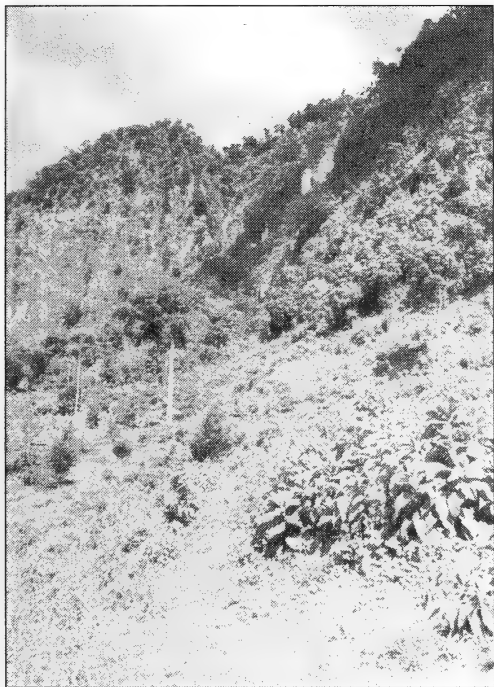


Figure 8. *Turesia* plateau and escarpment

woodland remnants in steep valleys above 1500 m may add new species to those recorded. Bias is believed to be significant against skulking species—owls in particular, although some tape playback was used. While Pearl-spotted Owlet *Glaucidium perlatum* and Verreaux's Eagle Owl *Bubo lacteus* used to be seen regularly below 1500 m in the early 1980s (M. Crawford, pers. comm.), the latter was observed by the writers only once in 1988 and twice in 1992; the lack of owl records above 2000 m is, however, thought to be real.

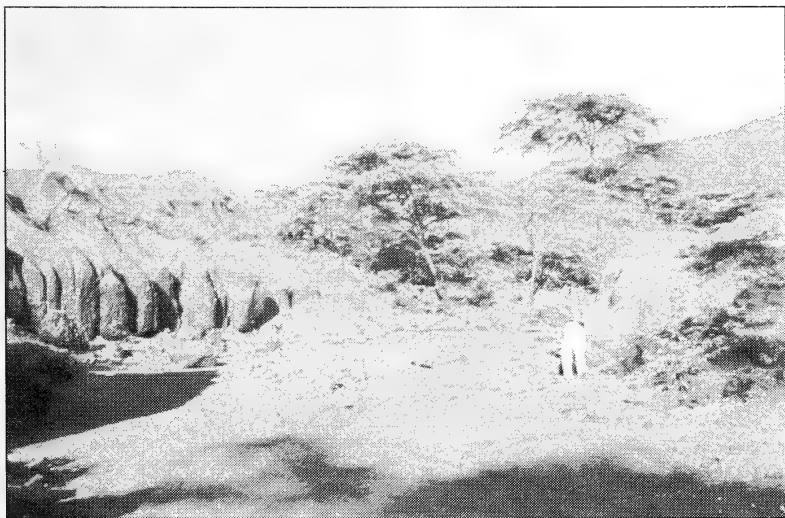


Figure 9. *Severe erosion near Kabokbok*

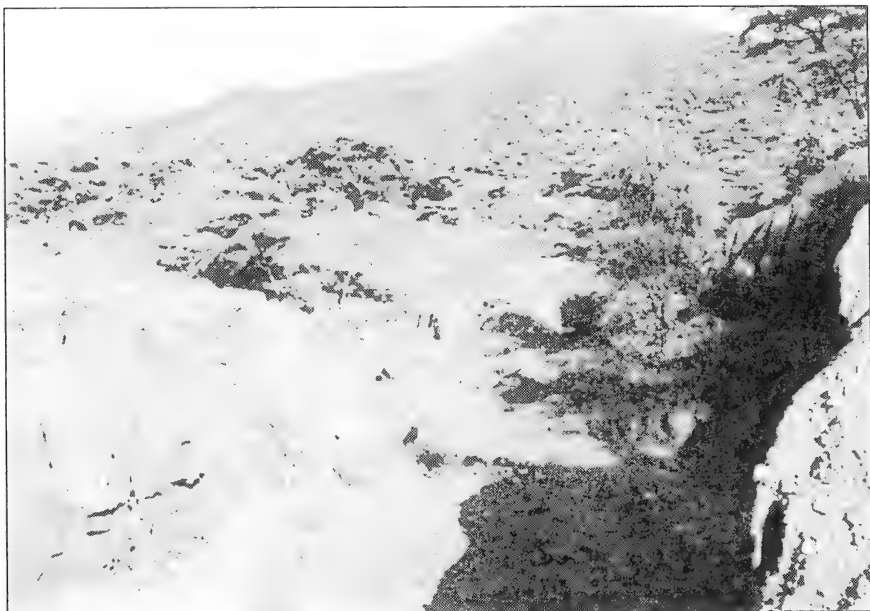


Figure 10. *Severe erosion near Kabokhok*

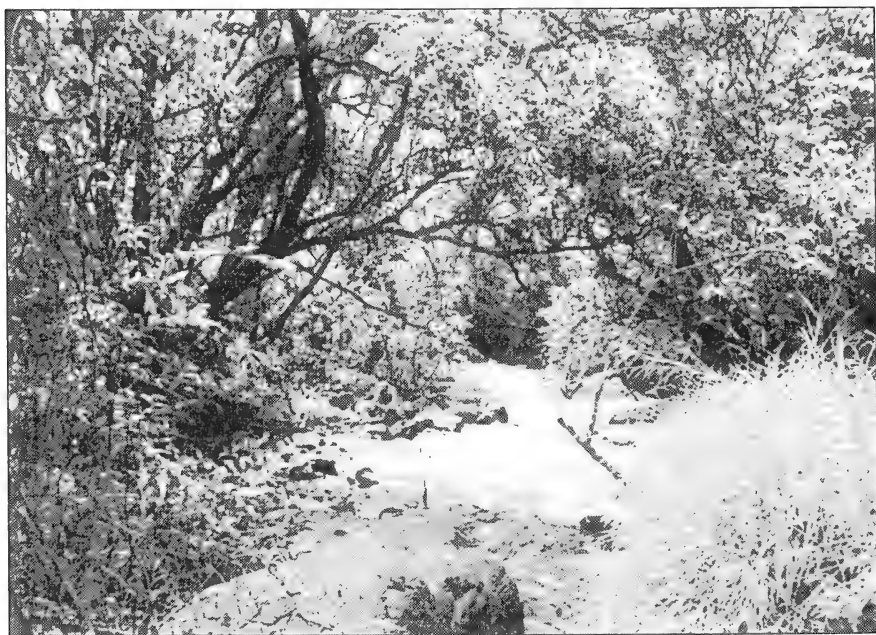


Figure 11. *The Kimwarer River*

Region A: 1250 – 2000 m

Description of survey area

The area of survey comprises the lease area of the KFC and immediate surrounding countryside, from the Turesia plateau at 2000 m to a grass airstrip 700 m below and 9 km to the east. Beyond the area of observation to the north and south, hills rise to 2400 m and, with the escarpment to the west, form an enclosing amphitheatre through which the Kimwarer River flows, joining the Mong River as tributaries to the Kerio River. To the east lies the floor of the Kerio Valley itself with the Ilkamasya Hills beyond. Avifauna is therefore influenced, not only by the mine site, but by both the dry valley floor and cooler, wetter adjacent highlands.

Since the observed site totals some 34 km², the map (Fig. 12) is sectioned into kilometre squares to ease habitat description.

Sector description

A, B 1 and 2, being above 2000 m, and are not included in Region A of the survey.

A, B 3, 4, C 1, 2, 3, D 5 and 6 are all above 1500 m and are of similar habitat comprising steep hillsides covered by *Acacia* woodland—commonly *Acacia abyssinica*—interspersed with mature *Euphorbia candelabrum* and occasional *Terminalia brownii*. In some locations this habitat type is subjected to seasonal burning and planting; however, overgrazing is not apparent. Cliffs and rock outcrops, where present, are host to various succulents, especially *Aloe*. Seasonal water courses hold mixed, often dense ravine woodland with vegetation as described for D 2–4.

D 1, at the upper limit of observation, contains a small murram quarry which, although devoid of vegetation on its floor, hosts a variety of flowering plants on its dry slopes, commonly *Rumex usambarensis*. *Dodonaea angustifolia* and *Teclea* associated with *Hibiscus cannabinus* surround the quarry. *Erythrina abyssinica* is common here.

D 2, 3 and 4, adjacent to the rivers, hold small remnants of ravine woodland which include mature trees from the following non-exhaustive genus list: *Acacia* (commonly *A. tortilis* and *A. eliator*), *Bauhinia*, *Cassia*, *Combretum*, *Tamarindus*, *Teclea*, *Terminalia*, *Vangueria* and *Ziziphus*. *Ficus sycamorus* is common, both in the ravine woodland and along the Kimwarer River.

A and B 5 contain the mine workings and, since in operation, afford areas of barren rock interspersed with patches of perennial grass and low *Acacia* bush bordered by mixed *Acacia* woodland to the west.

C 4 and 5 contain the staff housing which, on the northern side, is bounded by dense *Dodonaea angustifolia* and *Teclea* in a small ravine. The well tended gardens have been planted with exotic species such as *Plumeria rubra* and *Nerium oleander*, the latter often being parasitized by *Loranthus*. While the larger indigenous trees, e.g., *Pappea capensis*, *Acacia hockii*, *Combretum molle* and *Terminalia brownii* have been retained, introduced species include *Cupressus lusitanica*, *Tipuana tipu* and *Cassia spectabilis*. Fruit trees commonly planted within the area include guava *Psidium*,

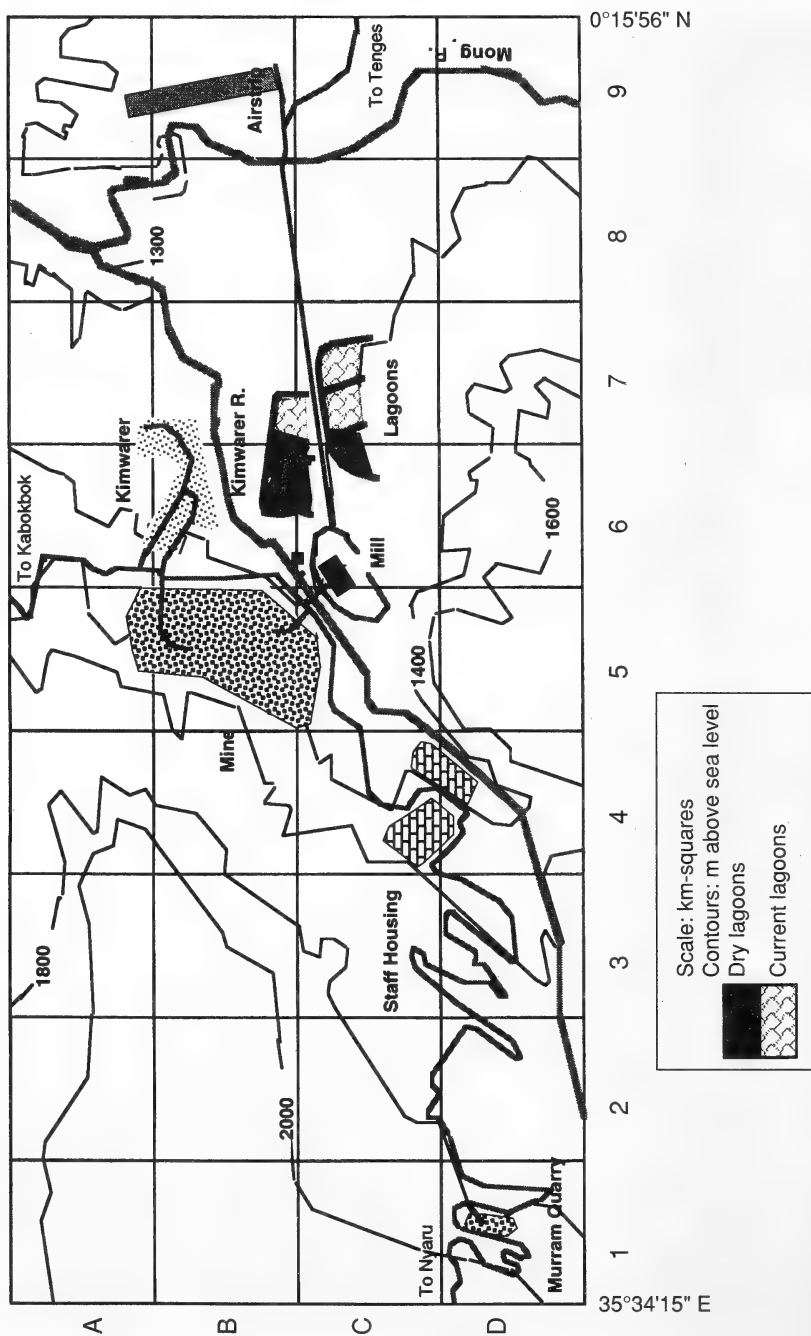


Figure 12. Map of survey area A

pawpaw *Carica papaya*, mango *Mangifera indica* and various *Citrus* species. Decorative plants, brought down from higher areas of the valley by the mine staff, provide further varied habitat and food sources.

A, B 6 and 7 contain the junior staff housing and Kimwarer village with surrounding *shambas* on which crops, including maize *Zea mays*, are grown. Mature *Acacia* dominates the woodland of the area with specimens of *A. polyacantha* and *A. albida* being common. Overgrazing is apparent outside the *shamba* area and erosion is evident too. The area also holds one of the largest expanses of mature *Ficus sycamorus*.

C 6 and 7 contain the most diverse habitat and include the large buildings of the processing plant. Fenced tailings lagoons, with relatively large areas of permanent water often with *Typha* and *Cyperus* in association, are surrounded by young *Acacia* and *Cassia didymobotryza* and perennial grasses. An area of mature *Acacia* (*A. seyal*,

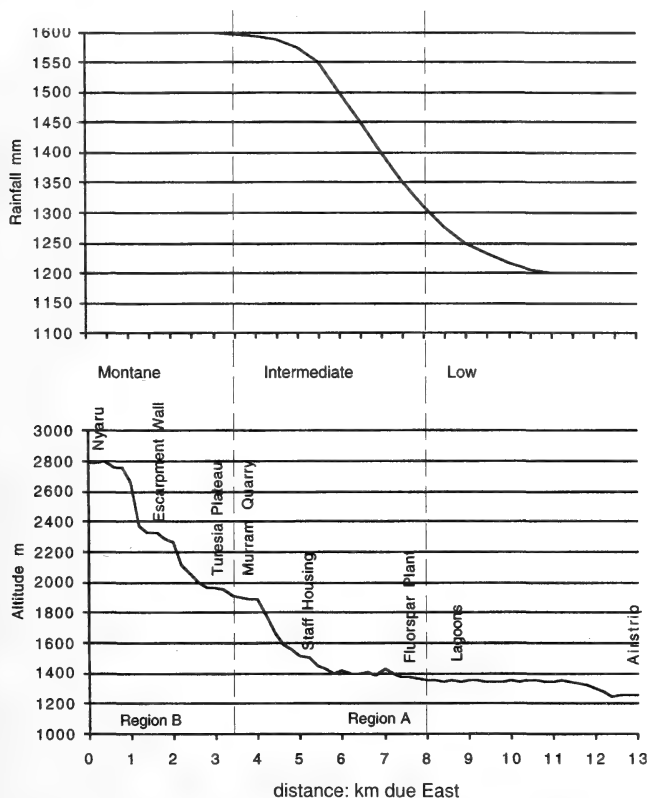


Figure 13. Section through the area and annual rainfall gradient

A. hockii, *A. tortilis* and *A. gerrardii*), with dense tangled undergrowth, covers one dried lagoon and a small tree nursery with an adjacent pond, partly overgrown by very dense *Cyperus*, completes the sector.

A and B 8 are areas of mixed woodland similar to C 8 but including numerous *Terminalia brownii* with an extensive understorey of *Croton dichogamus*.

C 8, D 7 and 8 are relatively flat lowland, characterized by mixed open woodland of *Acacia nilotica*, *A. seyal*, *Balanites aegyptiaca* and *Acokanthera schimperi*. Secondary growth is commonly *Ipomea* and extensive, dense *Croton dichogamus*.

A, B, C and D 9 are essentially flat with *Acacia drepanolobium* bush punctuated with mature trees as in C 8. Large areas of bush have been cleared, providing land for a grass airstrip, school playing fields and, in the majority, *shambas* on which grain crops, including maize, finger millet *Eleusine coracana* and sorghum *Sorghum bicolor* are grown. Other cash crops of the area include banana *Musa* spp, cassava *Manihot utilissima* and groundnuts *Arachis hypogaea*. Live fencing is practised with *Acacia senegala*, *Euphorbia triticollia* and sisal *Agave* often being used.

Species accounts

The following annotated list contains all species recorded below 2000 m throughout the survey period. Figures in parentheses refer to sectors on the map (Fig 12) and indicate the area most commonly or, in the case of rare sightings, the only area associated with an individual species. Where a location is not given, the species was either to be found throughout the area or other comments, for example 'overflying' are made. (For the monthly occurrence of visitors see p. 91.)

Species order follows Britton (1980). The first number is Britton's, the second is Lewis & Pomeroy's (1989); the subject area is in their square 49D.

PODICIPEDIDAE

Little Grebe *Tachybaptus ruficollis* 4, 2: (C 6) singles 20 Oct 1990, 20 Feb 1993, 1 May 1993.

PELECANIDAE

Pink-backed Pelican *Pelecanus rufescens* 12, 17: (C 6) 1 overflying 21 Jul 1991.

ARDEIDAE

Grey Heron *Ardea cinerea* 25, 40: (B 7 and 9) infrequent visitor.

Goliath Heron *Ardea goliath*, 26, 42: (B 7) single 6 Sep 1989.

Black-headed Heron *Ardea melanocephala*, 27, 43: (C 6) infrequent visitor: 4, 22 Dec 1991 and 5, 10 Jul 1993.

Squacco Heron *Ardea ralloides* 30, 31: (C 6) single 17 Sep 1989.

Cattle Egret *Bubulcus ibis* 32, 30: (C 7) 4, 19 Oct 1991, single 22 Dec 1991.

Green-backed Heron *Butorides striatus* 33, 34: (C 6) breeding resident.

Little Egret *Egretta garzetta* 36, 35: (C 6) 10, 27 Aug 1989, 15, 21 Oct 1990.

Yellow-billed Egret *Egretta intermedia* 38, 38: (C 6) single 12 Dec 1990.

SCOPIDAE

Hamerkop *Scopus umbretta* 42, 44: common probable breeding resident. Nests found along the Kimwarer River.

CICONIIDAE

Open-billed Stork *Anastomus lamelligerus* 43, 51: c. 200 flying east 24 Nov 1990.

Woolly-necked Stork *Ciconia episcopus* 46, 48: occasional visitor between January and the end of May each year: (B 7) three 2 May 1993. Latest presence 30 May 1993 [RHB].

Black Stork *Ciconia nigra* 47, 46: (C 6) 2, 12 Dec 1990.

Marabou *Leptoptilos crumeniferus* 49, 50: (C 6) singles 10 and 17 Nov 1990.

Yellow-billed Stork *Mycteria ibis* 50, 52: (A 8 and C 7) resident.

THRESKIORNITHIDAE

Hadada *Bostrychia hagedash* 51, 54: common (believed breeding) resident along rivers and in ravine woodland.

ANATIDAE

Egyptian Goose *Alopochen aegyptiacus* 61, 64: breeding resident.

ACCIPITRIDAE

Pallid Harrier *Circus macrourus* 1993, 95: southward bound migrant generally late September to end October annually. Single male 22 Jul 1993.

Montagu's Harrier *Circus pygarrus* 94, 96: southward bound migrant; single females 3 to 10 Nov 1991 and 8 Nov 1992.

Harrier Hawk *Polyboroides radiatus* 96, 94: regular, almost daily visitor.

Brown Snake Eagle *Circaetus cinereus* 98, 101: singles 31 Aug in both 1991 and 1992, 8 Nov 1992 and 10 Jul 1993.

Short-toed Snake Eagle *Circaetus gallicus* 100, 100: (C 4) single 27 Jan 1991 and pair 22 Jul 1993.

Bateleur *Terathopius ecaudatus* 101, 99: male overflying 17 Nov 1990.

Shikra *Accipiter badius* 102, 110: (C 6) singles 1 May 1992 [RHB] and 21 Jun 1992.

Great Sparrowhawk *Accipiter melanoleucus* 106, 104: occasional visitor.

Little Sparrowhawk *Accipiter minullus* 107, 109: resident.

African Goshawk *Accipiter tachiro* 111, 108: resident.

Tawny Eagle *Aquila rapax* 116, 129: occasional visitor.

Wahlberg's Eagle *Aquila wahlbergi* 118, 133: regular visitor, absent annually March to June.

Augur Buzzard *Buteo augur* 120, 119: regular visitor breeding at higher altitude.

Common Buzzard *Buteo buteo* 122, 117: regular passage migrant, south during October, north Jan to April.

Booted Eagle *Hieraetus pennatus* 127, 124: once in association with Common Buzzard 31 Jan 1993.

African Hawk Eagle *Hieraaetus spilogaster* 128, 125: pair and immature 8 Feb 1992.

Adults 24 Jun and 24 Feb, pair 23 May [RHB] and an immature 30 Jul 1993.

Long-crested Eagle *Lophaetus occipitalis* 130, 121: resident. (Extralimital breeding at 15 km northeast.)

Gabar Goshawk *Melierax gabar* 131, 114: occasional visitor.

Dark Chanting Goshawk *Melierax metabates* 132, 112: (B 8, 9 and C 6) regular visitor, mainly late rains.

Pale Chanting Goshawk *Melierax poliopterus* 133, 113: (B 9, C 4–6) rare visitor 6 Sep and 1 Nov 1989, 15 Feb and 8 Dec 1990 and 10 Feb 1991.

Crowned Eagle *Stephanoaetus coronatus* 135, 122: over-flying, singles 26 Jan and 24 Mar 1991, pair 22 Sep 1991 and single 19 Jul 1993.

Black Kite *Milvus migrans* 138, 135: (B 6) scarce resident, six 9 Dec 1990.

Cuckoo Hawk *Aviceda cuculoides* 139, 136: (C 4) adult 8 Nov 1992.

Black-shouldered Kite *Elanus caeruleus* 142, 139: breeding resident.

FALCONIDAE

Lanner Falcon *Falco biarmicus* 148, 146: (C 6) single 28 Sep 1991.

Kestrel *Falco tinnunculus* 161, 159: (C 4) rare visitor 17 Apr 1991, 13 Mar 1993 [RHB] and 26 Jun 1993.

Pygmy Falcon *Polihierax semitorquatus* 163, 142: (C 4) singles 25 Feb and 8 Jun 1990.

PHASIANIDAE

Crested Francolin *Francolinus sephaena* 182, 167: common breeding resident.

Scaly Francolin *Francolinus squamatus* 184, 161: (C 5) pair 23 Aug 1991.

NUMIDIDAE

Crested Guineafowl *Guttera edouardi* 188, 179: (C 3) Five 9 Feb, four 3 Mar and single 13 Oct 1990. (A 4) Single 22 Jul 1993.

Helmeted Guineafowl *Numida meleagris* 190, 180: breeding resident below 1400 m.

GRUIDAE

Crowned Crane *Baelearica pavonina* 194, 184: occasional visitor.

RALLIDAE

Black Crane *Limnecorax flavirostra* 201, 193: breeding resident.

Red-knobbed Coot *Fulica cristata* 215, 197: (C 7) singles 16 Dec 1990 and 21 Feb 1993.

CHARADRIIDAE

Three-banded Plover *Charadrius tricollaris* 239, 235: occasional visitor.

SCOLOPACIDAE

Common Sandpiper *Actitis hypoleucos* 252, 265: some present all year; migrants swell numbers, south September, north April.

Wood Sandpiper *Tringa glareola* 256, 263: (C 6) single 8 Nov 1992.

- Greenshank** *Tringa nebularia* 257, 261: (C 7) singles 11 Aug 1991 and 31 Oct 1992.
Green Sandpiper *Tringa ochropus* 258, 262: passage migrant, south October and north April. An individual which remained from early December 1990 to the end January 1991 may have been over-wintering.
Little Stint *Calidris minuta* 272, 239: (C 6) three, 9–11 Aug 1991.

RECURVIROSTRIDAE

- Black-winged Stilt** *Himantopus himantopus* 282, 267: (C 7) singles 21 Sep 1991, 31 Oct 1992 and 26 Jan 1993.

LARIDAE

- Black-headed Gull** *Larus ridibundus* 314, 295: (C 6-7) single 12 Dec 1990.

PTEROCLIDAE

- Lichtenstein's Sandgrouse** *Pterocles lichtensteinii* 335, 320: (A 9) 23 Jan and 31 Mar 1993. (D 3). On road in ravine woodland 3 Apr 1993. Always in pairs [All records RHB].

COLUMBIDAE

- Olive Pigeon** *Columba arquatrix* 339, 352: (C 4) single 23 Jan 1992.
Speckled Pigeon *Columba guinea* 341, 324: (C 6) common breeding resident. (See p. 107.)
Feral Pigeon *Columba livia* 342, 323: (C 6) single July to October 1991 in association with Speckled Pigeon.
Namaqua Dove *Oena capensis* 345, 339: (B 9) influx at end of late rains leaving again early in dry season.
Ring-necked Dove *Streptopelia capicola* 346, 328: breeding resident below 1600 m.
Dusky Turtle Dove *Streptopelia lugens* 348, 332: occasional visitor throughout October and November 1990, January and September 1992.
Laughing Dove *Streptopelia senegalensi* 351, 333: very common breeding resident.
Blue-spotted Wood Dove *Turtur afer* 355, 336: (C 6) breeding resident at 1350 m.
Emerald-spotted Wood Dove *Turtur chalcospilos* 356, 337: common breeding resident usually above 1400 m.
Tambourine Dove *Turtur tympanistria* 357, 335: Breeding resident 1500–2000 m.
Green Pigeon *Treron australis* 358, 340: (B 6-7 and C 4) probable breeding resident.

PSITTACIDAE

- Brown Parrot** *Poicephalus meyeri* 367, 344: common breeding resident.

MUSOPHAGIDAE

- White-bellied Go-away Bird** *Corythaixoides leucogaster* 374, 354: breeding resident below 1400 m.
Ross's Turaco *Musophaga rossae* 377, 361: breeding resident above 1500 m (see 'Habitat preferences of similar species', p. 106).
White-crested Turaco *Tauraco leucolophus* 381, 359: breeding resident below 1550 m (see p. 106).

CUCULIDAE

- Didric Cuckoo** *Chrysococcyx caprius* 388, 374: regular visitor most common during early rains.
- Emerald Cuckoo** *Chrysococcyx cupreus* 389, 372: believed to be breeding resident.
- Klaas' Cuckoo** *Chrysococcyx klaas* 391, 373: believed to be breeding resident.
- Black and White Cuckoo** *Clamator jacobinus* 393, 363: uncommon (migrant?) visitor to the area. Five (black morph) 30 Oct 1989, 2 (black and white) 29 Jul 1992 and singles (black and white) 21 Feb and 13 Mar 1993.
- Levaillant's Cuckoo** *Clamator levaillantii* 394, 364: (C 4) probable migrant; singles 30 Jun 1990, 30 Sep 1991, 19 Jul 1992 and 30 Jan 1993.
- Black Cuckoo** *Cuculus clamosus* 396, 366: breeding resident. Recorded towards the end of the early rains, May to July 1990, 1991 and 1992 and from March to July 1993 (see 'Breeding', p. 107).
- African Cuckoo** *Cuculus gularis* 397, 367: (C 8) first recorded 11 Jun 1992 (juv). Adult recorded 28 Feb 1993 (see p. 107).
- Red-chested Cuckoo** *Cuculus solitarius* 399, 365: regular breeding visitor, arriving during the dry season with most birds departing at the end of the early rains.
- White-browed Coucal** *Centropus superciliosus* 406, 377: uncommon breeding resident.

STRIGIDAE

- Verreaux's Eagle Owl** *Bubo lacteus* 414, 387: (C 4) single adults 3 Sep and 30 Oct 1992.
- Scops Owl** *Otus scops* 424, 382: (C 4) observed asleep in dense cover. Often seen illuminated by vehicle headlights. Believed resident.

CAPRIMULGIDAE

- Slender-tailed Nightjar** *Caprimulgus clarus* 427, 406: adult birds common below 1500 m. Often seen hunting around mine building lights.
- Plain Nightjar** *Caprimulgus inornatus* 433, 402: (B 6) one observed both in flight and on the ground during daylight hours 20 Oct 1990.
- Montane Nightjar** *Caprimulgus poliocephalus* 437, 398: (C 4) although more common at higher altitude, occasionally heard and seen hunting around estate lights at 1500 m.

APODIDAE

- Mottled Swift** *Apus aequatorialis* 442, 416: regular visitor from higher altitude.
- Little Swift** *Apus affinis* 443, 424: very common breeding resident nesting on buildings throughout the area. Numbers decline during the dry season annually.
- Eurasian Swift** *Apus apus* 444, 418: small numbers recorded during January and December of each year.
- Black Swift** *Apus barbatus* 445, 419: although relatively common at higher altitude, this species was seldom seen within this region of the study area. One record worthy of note is of c. 30 birds present at the lagoons (C 7) 1 May 1993.

White-rumped Swift *Apus caffer* 447, 422: rare until 1991 when it became a breeding resident. (See 'Species interaction', p. 105.)

Nyanza Swift *Apus niansae* 450, 421: pairs overflying 7 Dec 1990 and 1 Jun 1991 after storms.

Scarce Swift *Schoutedenapus myoptilus* 453, 414: four seen in association with White-rumped and Little Swifts, forced low by cloud before a storm 12 Apr 1992.

COLIIDAE

Speckled Mousebird *Colius striatus* 459, 425: common breeding resident.

Blue-naped Mousebird *Urocolius macrourus* 461, 427: Small flocks visit irregularly, most often in the dry season and below 1600 m.

TROGONIDAE

Narina's Trogon *Apaloderma narina* 462, 428: probable breeding resident above 1500 m.

ALCEDINIDAE

Giant Kingfisher *Ceryle maxima* 464, 430: one pair resident.

Pied Kingfisher *Ceryle rudis* 465, 431: irregular visitor.

Chestnut-bellied Kingfisher *Halcyon leucocephala* 473, 436: regular visitor especially during the dry season and early rains.

Woodland Kingfisher *Halcyon senegalensis* 475, 439: rare visitor below 1500 m.

Pygmy Kingfisher *Ispidina picta* 478, 435: probable breeding resident.

MEROPIDAE

White-throated Bee-eater *Merops albicollis* 479, 450: flocks of up to c. 60 often overflying the area. Least common October to December annually.

Eurasian Bee-eater *Merops apiaster* 480, 448: most common mid-October to end November and February. A few recorded December and January each year.

White-fronted Bee-eater *Merops bullockoides* 482, 441: common breeding resident of eastern lowland to 1400 m.

Cinnamon-chested Bee-eater *Merops oreobates* 488, 444: regular visitor from higher altitude.

Little Bee-eater *Merops pusillus* 491, 442: (B and C 6-7) uncommon breeding resident below 1350 m.

CORACIIDAE

Lilac-breasted Roller *Coracias caudata* 496, 455: irregular visitor to the northeast of the area.

Eurasian Roller *Coracias garrulus* 497, 454: (B 8) single 31 Oct 1992

Rufous-crowned Roller *Coracias naevia* 498, 456: singles observed to 1500 m: 11 Feb 1990, throughout December 1991, 6 Apr and 31 Oct 1992 and 21 Feb 1993.

Broad-billed Roller *Eurystomus glaucurus* 500, 457: (C 4) irregular migrant, two 16 Sep and 13 Oct 1990. Singles 8 Jul, 19 Sep and 12 Oct 1991.

UPUPIDAE

Hoopoe *Upupa epops* 502, 458: resident in open woodland below 1600 m (see p. 111)

PHOENICULIDAE

Scimitarbill *Phoeniculus cyanomelas* 505, 462: resident below 1550 m.

Abyssinian Scimitarbill *Phoeniculus minor* 507, 463: occasionally recorded in open woodland below 1400 m.

Green Wood Hoopoe *Phoeniculus purpureus* 508, 459: breeding resident.

BUCEROTIDAE

Black and White Casqued Hornbill *Bycanistes subcylindricus* 513, 464: visitor, most often between September of one year and March of the next.

Crowned Hornbill *Tockus alboterminatus* 515, 474: probable breeding resident observed above 1400 m.

Red-billed Hornbill *Tockus erythrorhynchus* 518, 472: (B 8) recorded at 1350 m, 9 Sep 1989, 11 Feb 1990, 21 Jan 1992 and 2 May 1993; always in pairs.

Yellow-billed Hornbill *Tockus flavirostris* 520, 469: (B 7-8) recorded in similar habitat to previous species 17 Sep 1989 and 14 Apr 1990.

Hemprich's Hornbill *Tockus hemprichii* 522, 473: uncommon and erratic visitor.

Jackson's Hornbill *Tockus jacksoni* 523, 471: the most common hornbill of the area—a breeding resident below 1550 m.

Grey Hornbill *Tockus nasutus* 524, 475: uncommon visitor to lowland *Acacia* mainly during the dry season.

Ground Hornbill *Bucorvus cafer* 528, 467: (D 9) pair 11 Feb 1990.

CAPITONIDAE

Yellow-spotted Barbet *Buccanodon duchaillui* 529, 487: singles (C 3) 13 Sep 1989 and (B 9) 21 Oct 1990.

Double-toothed Barbet *Lybius bidentatus* 534, 477: probable breeding resident.

Red-fronted Barbet *Lybius diadematus* 535, 482: (B 9) uncommon visitor but close extra-limital breeding resident observed within the area: 5 and 26 Oct, 9 Nov and 22 Dec 1991. Also 19 Apr 1992 and 23 Jan 1993.

Spotted-flanked Barbet *Lybius lacrymosus* 539, 484: relatively common breeding resident.

Yellow-rumped Tinkerbird *Pogoniulus bilineatus* 548, 495: relatively common, probable breeding resident of ravine woodland edge.

Moustached Green Tinkerbird *Pogoniulus leucomystax* 551, 492: visitor from higher altitude during the rains.

Red-fronted Tinkerbird *Pogoniulus pusillus* 552, 493: common breeding resident.

d'Arnaud's Barbet *Trachyphonus darnaudii* 557, 497: common breeding resident below 1400 m.

Red and Yellow Barbet *Trachyphonus erythrocephalus* 558, 499: uncommon breeding resident below 1400 m.

INDICATORIDAE

Black-throated Honeyguide *Indicator indicator* 563, 500: breeding resident.

Lesser Honeyguide *Indicator minor* 566, 501: believed resident.

Scaly-throated Honeyguide *Indicator variegatus* 569, 503: uncommon visitor

PICIDAE

Red-throated Wryneck *Jynx ruficollis* 575, 510: breeding resident at higher altitude.

One seen (A 9) 21 Jun 1992.

Nubian Woodpecker *Campethera nubica* 583, 512: breeding resident.

Cardinal Woodpecker *Dendropicos fuscescens* 585, 519: breeding resident almost always encountered in pairs.

Grey Woodpecker *Mesopicos goertae* 590, 522: uncommon resident below 1550 m.

Bearded Woodpecker *Thripias namaquus* 594, 520: rare (or under-recorded) resident.

ALAUDIDAE

Fawn Coloured Lark *Mirafrja africanoides* 613, 526: (C 6) single observed on a dry, former lagoon 17 Dec 1990.

HIRUNDINIDAE

House Martin *Delichon urbica* 623, 563: small numbers from October to early March annually then many hundreds congregate for two to three days (C 4) mid-March each year leaving a few stragglers into early April.

Striped Swallow *Hirundo abyssinica* 624, 559: breeding resident present between December and September with numbers decreasing during August and September annually, apparently totally absent October and November. (See 'Species interaction', p. 105.)

Angola Swallow *Hirundo angolensis* 627, 555: (C 6) single with Wire-tailed Swallows 5 Oct, two on 26 Oct 1991 and 5 Mar 1993.

Red-rumped Swallow *Hirundo daurica* 630, 556: breeding resident at higher altitude.

African Rock Martin *Hirundo fuligula* 632, 560: (C 4) uncommon breeding resident. (See 'Species interaction', p. 105.)

Barn Swallow *Hirundo rustica* 634, 553: small numbers recorded between September of one year and January of the next.

Mosque Swallow *Hirundo senegalensis* 636, 557: (C 5) single 2 Dec 1990.

Wire-tailed Swallow *Hirundo smithii* 637, 552: breeding resident using man-made structures for nest sites. Least common during the dry season.

Black Rough-wing *Psalidoprocne pristoptera* 640, 564: a daily visitor from the higher altitude Elgeyo escarpment.

African Sand Martin *Riparia paludicola* 642, 549: recorded as small flocks 24 Nov 1990 and 11 Mar 1991.

Sand Martin *Riparia riparia* 643, 550: occasionally recorded between October and March annually.

DICRURIDAE

Drongo *Dicrurus adsimilis* 644, 566: common breeding resident.

ORIOLIDAE

African Golden Oriole *Oriolus auratus* 646, 572: singles 28 Oct 1989, 9 Oct 1990 and 22 May 1993 [RHB].

Black-headed Oriole *Oriolus larvatus* 649, 568: common breeding resident.

Golden Oriole *Oriolus oriolus* 651, 573: singles 3 Oct 1989, 1 Dec 1990 and 31 Oct 1992.

CORVIDAE

Fan-tailed Raven *Corvus rhipidurus* 656, 579: unrecorded prior to May 1991 then a regular visitor.

PARIDAE

Grey Tit *Parus afer* 660, 581: (B 5) single 9 Jan 1991.

White-bellied Tit *Parus albiventris* 661, 583: breeding resident.

REMIZIDAE

African Penduline Tit *Remiz caroli* 668, 586: (B 6) uncommon breeding resident (see p. 111).

Mouse-coloured Penduline Tit *Remiz musculus* 669, 587: (B 7) single 8 Dec 1990 (see p. 111).

TIMALIIDAE

Arrow-marked Babbler *Turdoides jardineii* 681, 601: common breeding resident above 1400 m (see p. 106).

Brown Babbler *Turdoides plebejus* 684, 602: breeding resident, rarely observed above 1400 m (see p. 106).

Rufous Chatterer *Turdoides rubiginosus* 685, 595: common breeding resident.

CAMPEPHAGIDAE

Black Cuckoo Shrike *Campephaga flava* 688, 604: uncommon breeding resident.

PYCNONOTIDAE

Yellow-whiskered Greenbul *Andropadus latirostris* 710, 618: common breeding resident of ravine woodland above 1500 m.

Northern Brownbul *Phyllastrephus strepitans* 729, 628: uncommon breeding resident.

Common Bulbul *Pycnonotus barbatus* 732, 609: common breeding resident. Some birds with distinctive white eye-ring (see p. 111).

TURDIDAE

Spotted Morning Thrush *Cichladusa guttata* 748, 661: common breeding resident below 1500 m.

Robin Chat *Cossypha caffra* 749, 670: occasional visitor during the rains (see p. 107).

- White-browed Robin Chat** *Cossypha heuglini* 751, 666: common breeding resident (see p. 107).
- Red-capped Robin Chat** *Cossypha natalensis* 752, 669: probable breeding resident. Highest altitude record at 1650 m [FW] (see p. 111).
- Sprosser** *Luscinia luscinia* 763, 644: (B 6) single 6 Apr 1992.
- Little Rock Thrush** *Monticola rufocinerea* 768, 652: only recorded above 1600 m throughout November 1991, February and October 1992 and January and April 1993.
- Rock Thrush** *Monticola saxatilis* 769, 651: (B 5 and C 6) singles annually between October and May.
- Isabelline Wheatear** *Oenanthe isabellina* 775, 638: (B 9) singles throughout October 1990.
- Mourning Wheatear** *Oenanthe lugens* 776, 643: (B 9) singles during November and December 1990 and October 1991.
- Northern Wheatear** *Oenanthe oenanthe* 777, 639: a few on passage between October and January annually.
- Redstart** *Phoenicurus phoenicurus* 781, 647: (C 4) single throughout January 1990. Pair observed daily between January and Mar 1991.
- Whinchat** *Saxicola rubetra* 783, 635: (B 9) single 26 Oct 1991.
- Cliffchat** *Thamnolaea cinnamomeiventris* 792, 655: (C 4) single male singing 15–17 Feb 1993.
- Northern Olive Thrush** *Turdus abyssinicus* 793, 678: spasmodically recorded during the rains (see p. 107).
- African Thrush** *Turdus pelios* 801, 676: common breeding resident below 1550 m (see p. 107).

SYLVIIDAE

- Lesser Swamp Warbler** *Acrocephalus gracilirostris* 807, 696: (C 6) under-recorded but believed resident. First seen November 1991.
- Sedge Warbler** *Acrocephalus schoenobaenus* 811, 690: (C 6) single 27 Jan 1991.
- Grey Apalis** *Apalis cinerea* 817, 754: regular visitor from higher altitude.
- Yellow-breasted Apalis** *Apalis flavida* 818, 750: uncommon breeding resident below 1400 m.
- Grey-backed Camaroptera** *Camaroptera brachyura* 837, 760: common breeding resident.
- Rattling Cisticola** *Cisticola chiniana* 854, 727: common breeding resident.
- Winding Cisticola** *Cisticola galactotes* 860, 740: less common than the preceding species but believed resident along the Kimwarer River.
- Yellow-bellied Eremomela** *Eremomela icteropygialis* 878, 764: (C 6) singles 14 Apr 1990 and 19 May 1991.
- Olivaceous Warbler** *Hippolais pallida* 888, 698: (C 6) singles 25 Nov 1990, 8 Feb 1991 and throughout November 1991.
- Buff-bellied Warbler** *Phyllolais pulchella* 902, 749: common breeding resident mainly below 1400 m.

- Willow Warbler** *Phylloscopus trochilus* 908, 715: recorded on passage September to May. Very common on southward migration during October annually.
- Tawny-flanked Prinia** *Prinia subflava* 913, 743: uncommon probable breeding resident.
- Red-fronted Warbler** *Spiloptila rufifrons* 916, 747: (B 8) singles throughout February and October 1991.
- Blackcap** *Sylvia atricapilla* 917, 708: common on passage October to April but mainly February and March annually.
- Garden Warbler** *Sylvia borin* 918, 707: (C 4) singles 25 Nov 1990, 24 Feb and 14 Mar 1991.
- Barred Warbler** *Sylvia nisoria* 920, 705: (C 4) one with Blackcaps 29 Nov 1992.
- Northern Crombec** *Sylvietta brachyura* 921, 772: uncommon breeding resident of the drier east below 1350 m.
- Red-faced Crombec** *Sylvietta whytii* 925, 771: common breeding resident.

MUSCIPIDAE

- Grey Flycatcher** *Bradornis microrhynchus* 927, 793: breeding resident of the drier east. Most common below 1400 m (see p. 107).
- Pale Flycatcher** *Bradornis pallidus* 928, 792: common breeding resident above 1500 m (see p. 107).
- Silverbird** *Empidonax semipartitus* 929, 791: uncommon breeding resident of the extreme east below 1350 m.
- Collared Flycatcher** *Ficedula albicollis semitorquata* 930, 786: (C 4) single male remained for two days in gardens 1500 m, 6–7 Mar 1992 [A photograph is with the EANHS.]
- White-eyed Slaty Flycatcher** *Melaenornis chocolatina* 933, 790: (D 1) non-breeding resident.
- Black Flycatcher** *Melaenornis edolioides* 934, 789: (C 5) although observed in the same habitat, apparently rare in comparison to Southern Black Flycatcher. Singles 9 and 20 Oct 1990 and 4 May 1993.
- Southern Black Flycatcher** *Melaenornis pammelaina* 935, 788: fairly regular visitor during the rains.
- Dusky Flycatcher** *Muscicapa adusta* 936, 782: very common breeding resident of ravine woodland above 1400 m.
- Ashy Flycatcher** *Muscicapa caerulescens* 938, 785: (A 9) singles 29 Sep 1991 and 28 Sep 1992 [RHB].
- Gambaga Flycatcher** *Muscicapa gambagae* 941, 781: (A 9) singles 1 Nov 1992, (C 4) 7 and 25 Mar and 14 Jun 1993. Known to be an extralimital breeding species at 1200 m. (Richards 1992).
- Spotted Flycatcher** *Muscicapa striata* 945, 780: recorded annually during October, when common.
- Lead-coloured Flycatcher** *Myioparus plumbeus* 946, 787: locally common breeding resident below 1500 m (see p. 110).
- Chinspot Batis** *Batis molitor* 951, 794: common breeding resident.

Black-throated Wattle-eye *Platysteira peltata* 961, 803: (C 3) uncommon breeding resident of ravine woodland above 1600 m.

Paradise Flycatcher *Terpsiphone viridis* 968, 812: common, probable breeding resident. The white-phase male most often recorded.

MOTACILLIDAE

Richard's Pipit *Anthus novaeseelandiae* 981, 814: (B 9) single 17 Sep 1989.

Tree Pipit *Anthus trivialis* 984, 817: occasional birds between October and March but no December records.

African Pied Wagtail *Motacilla aguimp* 991, 831: common breeding resident.

Mountain Wagtail *Motacilla clara* 995, 833: resident along the Kimwarer River.

Yellow Wagtail *Motacilla flava* 996, 830: (B 7-9) recorded September–October and March annually. Largest flock 20, 26 Oct 1991.

MALACONOTIDAE

Northern Puffback *Dryoscopus gambensis* 1000, 837: uncommon breeding resident (see p. 111).

Black-headed Gonolek *Laniarius barbarus* 1003, 845: common breeding resident below 1500 m.

Tropical Boubou *Laniarius ferrugineus* 1004, 849: uncommon breeding resident.

Slate-coloured Boubou *Laniarius funebris* 1006, 850: common breeding resident below 1400 m.

Grey-headed Bush Shrike *Malaconotus blanchoti* 1012, 854: uncommon breeding resident.

Sulphur-breasted Bush Shrike *Malaconotus sulfureopectus* 1019, 852: common breeding resident.

Brubru *Nilaus afer* 1020, 835: rare breeding resident below 1400 m.

Brown-headed Tchagra *Tchagra australis* 1022, 840: uncommon, probable breeding resident above 1450 m.

Black-headed Tchagra *Tchagra senegal* 1025, 842: occasionally encountered below 1450 m.

LANIIDAE

Fiscal *Lanius collaris* 1029, 864: uncommon breeding resident.

Red-backed Shrike *Lanius collurio* 1030, 857: (C 6–7) singles 21 Oct and 25 Nov 1990 and 31 Oct 1992.

Grey-backed Fiscal *Lanius excubitorius* 1032, 861: uncommon breeding resident. Rarely recorded above 1350 m.

Red-tailed Shrike *Lanius isabellinus* 1034, 858: (B 9) single adult male 31 Oct 1992.

Lesser Grey Shrike *Lanius minor* 1036, 863: (B 9) singles 29 Sep and (C 4) 19 Oct 1991 (see p. 112).

Nubian Shrike *Lanius nubicus* 1037, 859: (B 9) an adult 31 Oct 1992 (see p. 112).

PRIONOPIDAE

White-crowned Shrike *Eurocephalus rueppelli* 1041, 874: uncommon breeding resident.

Helmet Shrike *Prionops plumata cristata* 1043, 870: regular visitor to mixed woodland, most common during the early rains.

STURNIDAE

Violet-backed Starling *Cinnyricinclus leucogaster* 1048, 896: breeding resident.

Wattled Starling *Creatophora cinerea* 1052, 899: (B 9) small party 17 Nov 1990.

Bronze-tailed Glossy Starling *Lamprotornis chalcurus* 1054, 878: (C 4) visitor between 13–28 Jan 1990 (see p. 112).

Blue-eared Glossy Starling *Lamprotornis chalybaeus* 1055, 879: common, apparently non-breeding resident.

Rüppell's Long-tailed Glossy Starling *Lamprotornis purpuropterus* 1060, 881: relatively common breeding resident.

Red-winged Starling *Onychognathus morio* 1064, 885: visitor from higher altitude, numbers increasing dramatically May to July annually when flocks of 50 or more observed above 1800 m.

Bristle-crowned Starling *Onychognathus salvadorii* 1065, 884: (C 4) small parties 1 Nov 1990, 25 Oct 1991 and 27 Jan 1993.

Slender-billed Chestnut-winged Starling *Onychognathus tenuirostris* 1066, 886: (C 4) two 22 Jul 1993.

Superb Starling *Spreo superbus* 1076, 890: common breeding resident below 1400 m (see p. 112).

Red-billed Oxpecker *Buphagus erythrorhynchus* 1078, 901: (B 9) small flocks between September and October 1991.

NECTARINIIDAE

Collared Sunbird *Anthreptes collaris* 1080, 902: common breeding resident above 1400 m.

Eastern Violet-backed Sunbird *Anthreptes orientalis* 1084, 906: (B 7 and C 9) resident below 1350 m.

Pygmy Sunbird *Anthreptes platurus* 1086, 903: (C 3) pair 21 Oct 1990.

Amethyst Sunbird *Nectarinia amethystina* 1091, 932: common breeding resident.

Hunter's Sunbird *Nectarinia hunteri* 1101, 931: probable breeding resident of the drier east below 1400 m.

Bronze Sunbird *Nectarinia kilimensis* 1103, 925: irregular visitor from higher altitude during the rains.

Mariqua Sunbird *Nectarinia mariquensis* 1107, 916: (C 7) resident below 1350 m.

Eastern Double-collared Sunbird *Nectarinia mediocris* 1108, 922: (C 4) single at 1500 m, 8 Mar 1992.

Olive Sunbird *Nectarinia olivacea* 1112, 929: Uncommon breeding resident.

Northern Double-collared Sunbird *Nectarinia preussi* 1115, 921: common breeding resident of higher altitude recorded once at 1500 m (C 4) 5 Aug 1992.

- Beautiful Sunbird** *Nectarinia pulchella* 1116, 920: common breeding resident.
- Scarlet-chested Sunbird** *Nectarinia senegalensis* 1122, 930: common breeding resident of the west above 1500 m.
- Variable Sunbird** *Nectarinia venusta* 1128, 910: probable breeding resident.
- Green-headed Sunbird** *Nectarinia verticalis* 1130, 934: common visitor from higher altitude during the rains.

ZOSTEROPIDAE

- Yellow White-eye** *Zosterops senegalensis* 1133, 937: common breeding resident.

PLOCEIDAE

- Grosbeak Weaver** *Amblyospiza albifrons* 1134, 970: (B 6 and C 6) breeding resident (see p. 110).
- Red-headed Weaver** *Anaplectes rubriceps* 1135, 969: uncommon breeding resident.
- Yellow Bishop** *Euplectes capensis* 1141, 978: (D 1) breeding resident below Turesia at 1950 m.
- Baglafaecht Weaver** *Ploceus baglafaecht* 1159, 960: regular visitor, breeding at higher altitude.
- Black-headed Weaver** *Ploceus cucullatus* 1165, 940: common breeding resident. Large numbers present during the rains.
- Golden-backed Weaver** *Ploceus jacksoni* 1171, 950: uncommon breeding resident at 1350 m.
- Little Weaver** *Ploceus luteolus* 1172, 957: rare breeding resident.
- Spectacled Weaver** *Ploceus ocularis* 1177, 962: rare, probable breeding resident.
- Chestnut Weaver** *Ploceus rubiginosus* 1180, 956: (B 9) breeding resident 1989–1992.
- Vitelline Masked Weaver** *Ploceus velatus* 1187, 954: (A 9) single 21 Jun 1992.
- Cardinal Quelea** *Quelea cardinalis* 1191, 988: (B 8-9) flocks present June to August from 1991.
- Red-billed Quelea** *Quelea quelea* 1193, 986: only common during 1991 (see p. 113).
- White-billed Buffalo Weaver** *Bubalornis albirostris* 1194, 1002: (C 4) rare visitor recorded January to March and June 1991.
- White-headed Buffalo Weaver** *Dinemellia dinemelli* 1196, 1004: relatively common breeding resident below 1350 m.
- White-browed Sparrow Weaver** *Plocepasser mahali* 1199, 997: the most common breeding weaver of the area.
- Chestnut-crowned Sparrow Weaver** *Plocepasser superciliosus* 1200, 999: locally common breeding resident below 1550 m.
- Grey-headed Social Weaver** *Pseudonigrita arnaudi* 1201, 1000: (A and B 9 and C 7) common breeding resident.
- Chestnut Sparrow** *Passer emini* 1205, 994: (A 9) breeding resident with numbers increasing June and July annually.
- Grey-headed Sparrow** *Passer griseus* 1206, 990: breeding resident (see p. 106).

- Rufous Sparrow** *Passer motitensis* 1207, 991: (A 9) uncommon visitor from the Turesia plateau.
- Yellow-spotted Petronia** *Petronia pyrgita* 1208, 995: singles 21 Jun and 1 Nov 1990 at 1300 m (A 9) and 21 Feb 1993 at 1500 m (A 4). Common extralimital species below 1250 m.
- Speckle-fronted Weaver** *Sporopipes frontalis* 1210, 996: (A 9) singles 29 Sep and 5 Oct 1991.
- Red-billed Firefinch Indigobird** *Hypochera chalybeata* 1211, 1019: uncommon, probable breeding resident (see p. 112).
- Steel-blue Whydah** *Vidua hypocherina* 1215, 1033: (B 9) two females and a male 22 Dec 1991.
- Pin-tailed Whydah** *Vidua macroura* 1216, 1032: common breeding resident below 1500 m.
- Paradise Whydah** *Vidua paradisaea* 1218, 1010: (B 9) small flocks August and September annually.

ESTRIDIDAE

- Waxbill** *Estrilda astrild* 1226, 1029: small numbers during May, June and September 1991 and July 1992.
- Black-cheeked Waxbill** *Estrilda erythronotus* 1228, 1035: (A 9) singles 21 Jun 1992 and 21 Feb 1993.
- Yellow-bellied Waxbill** *Estrilda melanotis* 1229, 1038: recorded April 1991 and 1992.
- Black-crowned Waxbill** *Estrilda nonnula* 1230, 1036: (C 4) three 20 Apr and two 31 Jul 1993.
- Crimson-rumped Waxbill** *Estrilda rhodopyga* 1233, 1031: (C 4) three 4 Apr 1993 [FW].
- African Firefinch** *Lagonosticta rubricata* 1239, 1022: uncommon breeding resident.
- Red-billed Firefinch** *Lagonosticta senegala* 1241, 1018: common breeding resident.
- Green-winged Pytilia** *Pytilia melba* 1256, 1008: (B 9) singles 29 Sep and 22 Dec 1991.
- Red-cheeked Cordon-bleu** *Uraeginthus bengalus* 1261, 1024: very common breeding resident.
- Blue-capped Cordon-bleu** *Uraeginthus cyanocephalus* 1262, 1025: (C 4) pair observed throughout February and March 1991.
- Cut-throat Amadina** *fasciata* 1264, 1046: (B 9) small flocks late July to December annually.
- Black and White Mannikin** *Lonchura bicolor* 1265, 1042: (C 4) single with Bronze Mannikins 27 Jan 1990.
- Bronze Mannikin** *Lonchura cucullata* 1266, 1041: common breeding resident.
- Grey-headed Silver-bill** *Lonchura griseicapilla* 1268, 1045: breeding resident at 1350 m.

FRINGILLIDAE

Golden-breasted Bunting *Emberiza flaviventris* 1273, 1050: uncommon breeding resident.

Cinnamon-breasted Rock Bunting *Emberiza tahapisi* 1278, 1047: recorded during September 1989, January 1990 and January, September and October 1991.

Yellow-rumped Seed-eater *Serinus atrogularis* 1280, 1058: common breeding resident.

African Citril *Serinus citrinelloides* 1283, 1054: visitor from higher altitude during early rains.

White-bellied Canary *Serinus dorsostriatus* 1285, 1057: irregular visitor during the late rains 1990 and 1991.

Streaky Seed-eater *Serinus striolatus* 1292, 1064: recorded twice prior to 1992 then common (see p. 113).

Brimstone Canary *Serinus sulphuratus* 1293, 1059: (C 3) singles 17 Sep 1989 and 11 Feb 1990.

List of species' occurrence

The following list includes only those species not considered permanent residents. It excludes rare sightings consisting of less than six individual monthly records, species resident at higher altitude but which visit regularly, especially during the rains, and Palearctic migrants. Brief details of these are given in 'Species accounts'.

If, during a particular month, visiting suitable habitat would always result in a sighting, the species is placed in category A. If observed during 60 per cent of visits, species receive category B, etc.

- A Always encountered.
- B Often encountered, recorded on more than 60 per cent of visits
- C Uncommon, but recorded on more than 30 per cent of visits
- D Scarce, but recorded on more than 10 per cent of visits
- E Rare, recorded on less than 10 per cent of visits
- Not recorded

Species	J	F	M	A	M	J	J	A	S	O	N	D
Grey Heron												
1989								-	-	E	-	-
1990	-	-	-	-	-	-	E	-	-	E	-	-
1991	-	-	-	-	E	-	-	-	-	E	E	D
1992	-	-	-	E	-	-	-	-	-	-	E	E
1993	-	-	-	-	-	-	-					

Species	J	F	M	A	M	J	J	A	S	O	N	D
Black-headed Heron												
1989								-	E	-	-	-
1990	-	E	-	-	-	-	-	-	-	E	-	E
1991	-	-	-	-	-	-	-	-	E	E	-	D
1993	-	E	-	-	E	E	D					
Great Sparrowhawk												
1989								-	-	-	-	-
1990	-	E	-	E	-	E	-	-	-	-	-	E
1991	-	E	E	-	-	-	E	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	E	-	E	-	-	-					
Tawny Eagle												
1989								-	-	-	-	-
1990	-	E	E	-	-	-	E	-	-	E	-	E
1991	-	-	E	-	-	-	E	E	E	E	-	E
1992	-	E	E	-	-	E	E	E	E	E	E	-
1993	E	-	-	-	-	-	-					
Wahlberg's Eagle												
1989								-	-	-	D	-
1990	-	-	-	-	-	-	-	D	-	D	-	-
1991	-	-	-	-	-	-	-	E	E	E	E	E
1992	D	D	-	-	-	-	E	E	E	E	E	E
1993	D	D	-	-	-	-	-					
Gabar Goshawk												
1989								-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	E
1991	-	-	-	-	-	-	-	-	-	-	-	E
1992	-	-	E	E	-	-	-	-	-	-	-	-
1993	-	E	-	E	-	-	E					
Dark Chanting Goshawk												
1989								-	C	C	C	C
1990	-	C	C	-	-	-	-	-	-	C	C	-
1991	-	-	-	-	-	-	-	C	C	C	C	B
1992	-	-	-	C	-	-	C	-	-	C	C	-
1993	-	-	-	-	C	-	-					
Black-shouldered Kite												
1989								-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	E	C	C	C	C	C
1992	-	-	-	-	-	-	C	D	D	C	C	C
1993	-	-	E	-	-	-	C					

Species	J	F	M	A	M	J	J	A	S	O	N	D
Crowned Crane												
1989								-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	D	D	D	-	-
1992	-	-	-	-	-	-	-	D	D	D	D	-
1993	-	-	-	-	E	-	E					
Three-banded Plover												
1989								-	-	-	-	B
1990	-	-	-	-	-	-	-	-	-	-	-	B
1991	A	-	-	-	-	A	-	A	A	-	B	B
1992	-	-	-	B	-	B	-	-	-	-	-	-
1993	-	-	-	-	-	-	-					
Namaqua Dove												
1989								B	A	A	A	A
1990	-	E	-	-	-	-	-	-	-	A	A	A
1991	-	-	-	-	-	-	-	B	A	A	A	A
1992	-	-	-	-	-	E	-	-	-	A	A	A
1993	-	-	-	-	-	-	-					
Didric Cuckoo												
1989								-	-	E	-	-
1990	-	-	-	-	-	A	-	-	-	E	-	E
1991	E	-	-	-	A	A	-	-	-	-	D	E
1992	-	-	A	A	-	A	-	-	-	-	-	-
1993	-	B	A	A	A	A	B					
Emerald Cuckoo												
1989								-	B	-	-	-
1990	-	-	-	-	-	-	-	-	B	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	E
1992	-	-	A	A	B	A	-	-	-	-	-	-
1993	-	A	A	A	A	A	A					
Red-chested Cuckoo												
1989								-	-	-	-	E
1990	B	A	A	A	A	A	A	-	-	-	-	E
1991	B	A	A	A	A	A	A	-	E	-	-	-
1992	-	-	B	A	A	A	A	-	-	-	-	-
1993	B	A	A	A	A	A	A					
Blue-naped Mousebird												
1989								-	-	-	B	B
1990	C	C	-	-	-	-	-	-	-	C	C	-
1991	-	-	C	-	C	-	-	B	B	B	A	A
1992	-	-	-	C	-	-	C	-	-	A	A	-
1993	B	B	B	B	-	C	C					
Pied Kingfisher												
1989								-	E	E	-	E
1990	-	-	-	-	-	-	E	-	-	-	-	E
1991	-	-	-	-	-	-	E	E	E	-	-	E
1992	-	-	-	-	-	-	-	-	-	E	E	-
1993	E	-	-	-	D	-	-					

Species	J	F	M	A	M	J	J	A	S	O	N	D
Chestnut-bellied Kingfisher												
1989								-	D	D	D	D
1990	D	-	-	-	-	-	-	-	-	D	D	D
1991	D	D	D	-	E	-	-	-	-	-	D	D
1992	D	D	D	D	D	D	D	E	-	-	-	-
1993	D	D	E	D	D	E	E					
Woodland Kingfisher												
1989								-	-	-	-	-
1990	D	-	-	-	-	-	-	-	-	-	-	-
1991	D	D	D	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	D	D	-	-	-	-
1993	-	-	-	-	-	-	-					
Lilac-breasted Roller												
1989								E	E	-	-	-
1990	-	E	-	-	-	-	-	-	-	E	-	E
1991	-	-	-	-	-	-	E	-	-	E	-	E
1992	-	E	-	-	-	E	-	-	-	E	-	-
1993	E	E	-	-	-	-	-					
Abyssinian Scimitarbill												
1989								-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	D	D	D	E	E	D	D
1992	-	E	-	-	-	E	-	-	-	-	E	-
1993	-	-	-	-	-	-	-					
Black and White Casqued Hornbill												
1989								-	C	C	-	-
1990	C	-	-	-	-	-	-	-	-	C	C	C
1991	-	-	C	-	C	-	-	-	C	-	-	C
1992	C	-	-	-	-	-	-	-	C	C	C	C
1993	C	C	C	-	-	-	-					
Hemprich's Hornbill												
1989								E	E	-	-	E
1990	E	-	-	-	-	E	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	D	-	-	E
1992	-	-	-	-	-	-	E	-	-	-	E	-
1993	-	-	-	-	-	-	E					
Grey Hornbill												
1989								-	E	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	E	E
1991	-	-	-	-	-	-	-	-	-	D	D	D
1992	-	E	-	E	-	-	-	-	-	D	D	-
1993	-	E	E	E	E	-	-					
Scaly-throated Honeyguide												
1989								-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	E	E	-	-	-	-	-	E	-	-
1992	-	-	E	E	-	-	-	E	-	-	E	-
1993	-	E	E	-	-	-	-					

Species	J	F	M	A	M	J	J	A	S	O	N	D
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Striped Swallow

1989								C	D	-	-	D
1990	A	A	A	A	A	A	A	C	-	-	-	D
1991	A	A	A	A	A	A	A	C	E	-	-	A
1992	A	A	A	A	A	A	A	A	E	-	-	A
1993	A	A	A	A	A	A	B					

Fan-tailed Raven

1989								-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	E	-	-	D	D	D	D	D	D	D	D
1992	D	D	D	D	D	D	D	D	D	D	D	D
1993	D	-	D	-	D	D	D					

Southern Black Flycatcher

1989								E	E	-	-	-
1990	-	-	E	E	E	E	-	-	-	-	-	-
1991	-	-	-	-	E	-	-	E	E	E	E	E
1992	-	-	-	E	E	-	E	-	-	-	-	-
1993	-	-	E	E	E	-	-					

Helmet Shrike

1989								-	D	D	D	D
1990	D	D	D	-	-	-	D	D	C	C	C	C
1991	D	D	D	C	C	C	C	B	B	D	D	D
1992	D	D	D	C	C	C	C	C	B	D	D	D
1993	D	D	B	A	A	A	A					

Cardinal Quelea

1989								-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	B	B	B	E	-	-	-
1992	-	-	-	-	-	B	B	B	E	-	-	-
1993	-	-	-	-	-	B	B					

Red-billed Quelea

1989								-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	-	-	-
1991	E	D	D	D	D	-	-	D	D	D	D	D
1992	E	-	-	D	-	-	-	D	D	D	D	D
1993	E	-	-	-	-	D	-					
Species	J	F	M	A	M	J	J	A	S	O	N	D

White-bellied Canary

1989								-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-	E	E	E
1991	-	-	-	-	-	-	-	E	E	E	-	E
1992	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-					

Region B: 2000 m – 2750 m

Description of survey area

The sloping Turesia plateau, which occupies the 2000 m to 2300 m altitude range, has essentially been clear-felled for cultivation and only a few typical *Tabernaemontana*, *Albiza* and *Apodytes* forest-type trees remain. Agriculture on the plateau consists of root crops and extensive seasonal sorghum *Sorghum bicolor* and finger millet *Eleusine coracana*. *Acacia mearnsii* and Cupressaceae have been introduced and, with *Acacia abyssinica* and *Eucalyptus*, are now probably the most numerous trees of the area. Further evidence of the former montane forestation is provided by the remnant floristic composition of fragmented woodlands and hedgerows: *Hibiscus ludwigi*, *Senecio* and *Rubus*, for example, being typically abundant and, with Convolvulaceae, forming dense mats of vegetation. Flora of upland forest edges—*Crotalaria* (commonly *agatiflora*)—is to be found throughout extensive *Verninia auriculifera*–*Plectranthus barbatus* thickets.

Above the plateau, luxuriant forest-edge flora begins with emergent *Euphorbia obovalifolia* and *Dombeya* (commonly *burgessiae*) draped with lianas, *Cyphostemma* and *Cyathula* forming curtains of leaves. Flacourtiaceae, *Dracaena steudneri*, *Podocarpus*, *Olea* and an occasional *Juniperus* stand proof to the higher rainfall of the area. Visceaceae and Loranthaceae parasitize throughout. *Impatiens sodenii* and *I. tinctoria* are typical along water courses and *Plectranthus laxiflorus*, which prefers moist ground, is common.

The escarpment wall, almost sheer in places, creates a sudden transition from the dense tangle of montane forest-type vegetation to steep upper slopes dominated by *Dombeya burgessiae* which, at 2500 m, have grown to mature trees. This area holds relatively extensive low vegetation, including bracken *Pteridium aquilinum* and *Hebenstretia* among the trees.

At around 2600 m a patchwork of bamboo and Cupressaceae occurs, quickly giving way to the escarpment summit and extensive *Cupressus lusitanica*. Many of the trees on the upper escarpment and summit are clothed in Ascolichens.

Species accounts

The following annotated list contains species observed between 2000 m and 2750 m. Those species marked with an asterisk (*) are considered montane endemics, being only encountered above 2000 m. Apart from the Woolly-necked Stork, Black and White Casqued Hornbill, Sharpe's Starling *Cinnyricinclus sharpii*, Crimson-rumped Waxbill, Yellow-fronted Canary and Palearctic migrants, all species are thought to be resident. All species recorded overflying are accounted for in 'Species accounts'.

CICONIIDAE

Woolly-necked Stork *Ciconia episcopus* 46, 48: singles preening, standing in a small pool at 2700 m 15 Jan 1991 and 4 May 1992.

ACCIPITRIDAE

Harrier Hawk *Polyboroides radiatus* 96, 94: breeding resident often seen foraging along water courses.

African Goshawk *Accipiter tachiro* 111, 108: breeding resident.

Augur Buzzard *Buteo augur* 120, 119: breeding resident.

COLUMBIDAE

Speckled Pigeon *Columba guinea* 314, 324: common breeding resident along the crags of the escarpment.

Red-eyed Dove *Streptopelia semitorquata* 350, 330: breeding resident.

Emerald-spotted Wood Dove *Turtur chalcospilos* 356, 337: extremely common breeding resident. Observed to 2300 m.

PSITTACIDAE

Brown Parrot *Poicephalus meyeri* 367, 344: regularly observed to 2450 m in large trees of forest remnant.

MUSOPHAGIDAE

Hartlaub's Turaco *Tauraco hartlaubi** 379, 358: breeding resident (see p. 106).

CUCULIDAE

Didric Cuckoo *Chrysococcyx caprius* 388, 374: occasionally seen on the Turesia plateau at 2100 m.

Klaas' Cuckoo *Chrysococcyx klaas* 391, 373: apparently resident, descending to lower altitude during the rains.

Red-chested Cuckoo *Cuculus solitarius* 399, 365: a regular visitor during early rains from March or April.

CAPRIMULGIDAE

Montane Nightjar *Caprimulgus poliocephalus* 473, 398: the most common nightjar of the area, easily located by its distinctive call. Seen on the escarpment road at dawn and dusk.

APODIDAE

Mottled Swift *Apus aequatorialis* 442, 416: observed around the escarpment; regularly descending to low altitude to feed.

Black Swift *Apus barbatus* 445, 419: a relatively common swift believed to be a breeding resident.

COLIIDAE

Speckled Mousebird *Colius striatus* 459, 425: common below 2600 m.

TROGONIDAE

Narina's Trogon *Apaloderma narina* 462, 428: fairly common, probable breeding resident.

MEROPIDAE

Cinnamon-chested Bee-eater *Merops oreobates* 448, 444: breeding resident often visiting lower altitudes.

PHOENICULIDAE

White-headed Wood Hoopoe *Phoeniculus bollei** 503, 461: observed in forest remnant along the escarpment above 2350 m.

Scimitarbill *Phoeniculus cyanomelas* 505, 462: occasionally recorded in woodland at 2100 m.

BUCEROTIDAE

Black and White Casqued Hornbill *Bycanistes subcylindricus* 513, 464: rarely observed, never above the bamboo at 2600 m.

Crowned Hornbill *Tockus albaterminatus* 515, 474: breeding resident.

Ground Hornbill *Bucorvus cafer* 528, 467: pairs 24 Feb 1990 and 29 Mar 1991 in forest clearings on the escarpment at 2700 m.

CAPITONIDAE

Yellow-spotted Barbet *Buccanodon duchaillui* 529, 487: uncommon species of forest remnant above 2350 m.

Double-toothed Barbet *Lybius bidentatus* 534, 477: found in well wooded areas to 2250 m.

Yellow-rumped Tinkerbird *Pogoniulus bilineatus* 548, 495: common breeding resident easily observed between 2350 m and 2450 m in thickets on the escarpment roadsides.

Moustached Green Tinkerbird *Pogoniulus leucomystax* 551, 492: uncommon (possibly under recorded) between 2350 m and 2450 m.

Red-fronted Tinkerbird *Pogoniulus pusillus* 552, 493: occasionally at Turesia to 2200 m.

Yellow-billed Barbet *Trachylaemus purpuratus** 556, 496: under-recorded but observed in clearings above 2000 m.

INDICATORIDAE

Black-throated Honeyguide *Indicator indicator* 563, 500: recorded on the Turesia plateau at 2100 m.

Lesser Honeyguide *Indicator minor* 566, 501: regularly observed to 2600 m.

PICIDAE

Red-throated Wryneck *Jynx ruficollis* 575, 510: breeding resident of the Turesia plateau.

Fine-banded Woodpecker *Campethera tullbergi** 584, 515: observed in forest remnant above 2350 m.

Cardinal Woodpecker *Dendropicos fuscescens* 585, 519: common throughout the area to 2500 m.

Bearded Woodpecker *Thripias namaquus* 594, 520: regularly recorded in mixed woodland.

HIRUNDINIDAE

Red-rumped Swallow *Hirundo daurica* 630, 556: regularly observed throughout the area.

African Rock Martin *Hirundo fuligula* 632, 560: breeding resident on the escarpment.

Black Rough-wing *Psalidoprocne pristoptera* 640, 564: common resident.

ORIOOLIDAE

Black-headed Oriole *Oriolus larvatus* 649, 568: common to 2300 m.

PARIDAE

White-bellied Tit *Parus albiventris* 661, 583: relatively common breeding resident.

TIMALIIDAE

African Hill Babbler *Alcippe abyssinica** 671, 594: only recorded in dense vegetation at forest edge, 2300 m.

Mountain Illadopsis *Trichastoma pyrrhopterum** 676, 591: recorded in dense undergrowth in forest remnant at 2700 m.

Arrow-marked Babbler *Turdoides jardineii* 681, 601: breeding resident of the Turesia plateau.

CAMPEPHAGIDAE

Purple-throated Cuckoo Shrike *Campephaga quiscalina** 691, 606: uncommon in forest remnant at 2350 m.

Grey Cuckoo Shrike *Coracina caesia** 693, 607: common in forest remnant above 2350 m.

PYCNONOTIDAE

Mountain Greenbul *Andropadus tephrolaemus** 704, 615: observed in the bamboo zone above 2600 m.

Yellow-whiskered Greenbul *Andropadus latirostris* 710, 618: common breeding resident.

Placid Greenbul *Phyllastrephus placidus** 727, 626: occasionally seen at 2400 m.

Common Bulbul *Pycnonotus barbatus* 732, 609: most common on Turesia plateau but recorded to 2750 m.

TURDIDAE

Robin Chat *Cossypha caffra* 749, 670: common breeding resident (see p. 107).

Little Rock Thrush *Monticola rufocinerea* 768, 652: encountered in the open between 2000 m and 2500 m.

Anteater Chat *Myrmecocichla aethiops** 770, 653: occasionally recorded from Nyaru at 2750 m.

White-starred Forest Robin *Pogonocichla stellata** 782, 662: uncommon (or under-recorded) but in mixed bamboo/forest undergrowth above 2600 m.

Northern Olive Thrush *Turdus abyssinicus* 793, 678: breeding resident (see p. 107).

SYLVIIDAE

Grey Apalis *Apalis cinerea* 817, 754: fairly common above 2350 m.

Chestnut-throated Apalis *Apalis porphyrolaema** 824, 756: observed between 2000 m and 2500 m.

Black-collared Apalis *Apalis pulchra** 825, 758: common breeding resident between 2100 m and 2450 m.

Cinnamon Bracken Warbler *Bradypterus cinnamomeus** 835, 684: recorded between 2350 m and 2450 m.

Grey-backed Camaroptera *Camaroptera brachyura* 837, 760: common breeding resident occasionally to 2350 m.

Mountain Yellow Warbler *Chloropeta similis** 844, 703: in bracken and open areas of bamboo between 2450 m and 2600 m.

Hunter's Cisticola *Cisticola hunteri** 861, 738: typically encountered in pairs duetting from dense cover above 2000 m.

Grey-capped Warbler *Eminia lepida** 875, 763: resident between 2300 m and 2450 m.

Willow Warbler *Phylloscopus trochilus* 908, 715: regular migrant during October.

Brown Woodland Warbler *Phylloscopus umbrovirens** 909, 712: in well forested or bamboo areas above 2300 m.

Tawny-flanked Prinia *Prinia subflava* 913, 743: present in secondary growth to 2100 m.

Blackcap *Sylvia atricapilla* 917, 708: passage migrant: south November, north February–April.

MUSCICAPIDAE

White-eyed Slaty Flycatcher *Melaenornis chocolatina* 933, 790: breeding resident above 2000 m.

Dusky Flycatcher *Muscicapa adusta* 936, 782: common breeding resident.

Spotted Flycatcher *Muscicapa striata* 945, 780: migrant: south October–November, north March–April.

Chin-spot Batis *Batis molitor* 951, 799: common breeding resident to 2400 m.

Paradise Flycatcher *Terpsiphone viridis* 968, 812: occasionally observed to 2450 m in open woodland.

MOTACILLIDAE

African Pied Wagtail *Motacilla aguimp* 991, 831: common to 2350 m.

Mountain Wagtail *Motacilla clara* 995, 833: occasionally recorded on the Kimwarer River to 2200 m.

Yellow Wagtail *Motacilla flava* 996, 830: passage migrant October–March.

MALACONOTIDAE

Northern Puffback *Dryoscopus gambensis* 1000, 837: recorded to 2350 m.

Tropical Boubou *Laniarius ferrugineus* 1004, 849: breeding resident to 2400 m.

Brown-headed Tchagra *Tchagra australis* 1022, 840: common throughout the area, regularly to 2350 m.

LANIIDAE

Fiscal *Lanius collaris* 1029, 864: common breeding resident.

STURNIDAE

Violet-backed Starling *Cinnyricinclus leucogaster* 1048, 896: occasionally recorded to 2600 m.

Sharpe's Starling *Cinnyricinclus sharpii** 1049, 897: observed at 2600 m, 2 Feb 1992.

Blue-eared Glossy Starling *Lamprotornis chalybaeus* 1055, 879: common on Turesia plateau to 2200 m.

Red-winged Starling *Onychognathus morio* 1064, 885: resident along the escarpment.

Slender-billed Chestnut-winged Starling *Onychognathus tenuirostris* 1066, 886: recorded during the early rains, often associated with inaccessible waterfalls on the escarpment above 2450 m.

NECTARINIIDAE

Bronze Sunbird *Nectarinia kilimensis* 1103, 925: breeding resident on the Turesia plateau around 2100 m.

Olive Sunbird *Nectarinia olivacea* 1112, 929: recorded in bamboo and forest above 2400 m.

Northern Double-collared Sunbird *Nectarinia preussi* 1115, 921: the most common sunbird in the area above 2250 m. Found in all habitats.

Tacazze Sunbird *Nectarinia tacazze** 1126, 924: a relatively common species.

Variable Sunbird *Nectarinia venusta* 1128, 910: breeding resident.

Green-headed Sunbird *Nectarinia verticalis* 1130, 934: breeding resident, observed to 2350 m.

ZOSTEROPIDAE

Yellow White-eye *Zosterops senegalensis* 1133, 937: breeding resident.

PLOCEIDAE

Yellow Bishop *Euplectes capensis* 1141, 978: usually encountered in the *shamba* area of Turesia Market.

Baglafecht Weaver *Ploceus baglafecht* 1159, 960: common breeding resident.

Black-billed Weaver *Ploceus melanogaster** 1174, 964: uncommon breeding resident of forest remnant above 2350 m.

Grey-headed Sparrow *Passer griseus* 1206, 990: common around Turesia Market.

Rufous Sparrow *Passer motitensis* 1207, 991: resident around human habitation in open woodland at Turesia Market.

ESTRILDIDAE

Abyssinian Crimson-wing *Cryptospiza salvadorii** 1224, 1016: found in undergrowth and bamboo above 2600 m.

Waxbill *Estrilda astrild* 1226, 1029: occasionally encountered to 2350 m.

Yellow-bellied Waxbill *Estrilda melanotis* 1229, 1038: common between 2000 m and 2350 m.

Black-crowned Waxbill *Estrilda nonnula* 1230, 1036: a fairly common waxbill of secondary growth and forest edge to 2350 m.

Crimson-rumped Waxbill *Estrilda rhodopyga* 1233, 1031: only recorded at 2350 m on 27 and 29 Dec 1991.

Grey-headed Negrofinch *Nigrita canicapilla** 1246, 1005: locally common in forest remnant above 2350 m.

Red-cheeked Cordon-bleu *Uraeginthus bengalus* 1261, 1024: breeding resident on the Turesia plateau.

FRINGILLIDAE

Golden-breasted Bunting *Emberiza flaviventris* 1273, 1050: relatively common around Turesia.

Thick-billed Seed-eater *Serinus burtoni** 1281, 1063: observed between 2000 m and 2600 m.

African Citril *Serinus citrinelloides* 1283, 1054: observed at forest edge and in bamboo.

Yellow-fronted Canary *Serinus mozambicus* 1290, 1056: three observed at Turesia 2100 m, 29 Dec 1991.

Streaky Seed-eater *Serinus striolatus* 1292, 1064: common in secondary bush and forest edge.

Discussion

Analysis of records

A total of 338 species was recorded for the area between 1250 m and 2750 m: 25 were apparently montane endemic, 108 pluriregional, nine true intermediate and eight confined to low altitude, mainly visiting the area during very dry periods.

Table 1. *General categorization of species*

Wanderer to the area	21
Palearctic migrant	41
Intra-African migrant	18
Showing seasonal movement	30
Occasional visitor	40
Non-breeding resident	28
Probable breeding resident	33
Confirmed breeding resident	127

Extension of range

Many of the recorded species indicate some form of range extension or confirmation of old distribution records when compared with Lewis & Pomeroy (1989). The survey site is in the western half of their square 49D and records are as follows; numbers in parentheses after a species indicate the number of sightings (days).

Renewal of former records — presence

Wanderer: Brimstone Canary (2).

Palaeartic migrant: Garden Warbler (3), Lesser Grey Shrike (2).

Intra-African migrant: Plain Nightjar (1), Broad-billed Roller (5).

Seasonal movement: Olive Pigeon (1). Dusky Turtle Dove (numerous), Sharpe's Starling (1).

Non-breeding resident: Crested Guineafowl (4), Red-throated Wryneck (numerous), White-starred Forest Robin (numerous), Waxbill (numerous).

Probable breeding resident (all numerous sightings): Montane Nightjar, Moustached Green Tinkerbird, Yellow-billed Barbet, African Hill Babbler, Purple-throated Cuckoo Shrike, Mountain Greenbul, Anteater Chat.

Renewal of former records — breeding (all numerous sightings)

Ring-necked Dove, Brown Parrot, Hartlaub's Turaco, White-fronted Bee-eater, Cinnamon-chested Bee-eater, Black Cuckoo Shrike, Dusky Flycatcher, White-eyed Slaty Flycatcher, Violet-backed Starling, Amethyst Sunbird, Yellow White-eye, Yellow Bishop, Chestnut-crowned Sparrow Weaver, Golden-breasted Bunting.

Extension of range — presence

Wanderer: Nyanza Swift (2), Scarce Swift (1), Fawn-coloured Lark (1), Angola Swallow (2), Grey Tit (1), Mouse-coloured Penduline Tit (1), Red-fronted Warbler (numerous), Black and White Mannikin (1).

Palaeartic migrant: Booted Eagle (1), Black-headed Gull (1), Eurasian Swift (numerous), Golden Oriole (3), Sprosser (1), Northern Wheatear (numerous), Whinchat (1), Sedge Warbler (1), Barred Warbler (1), Collared Flycatcher (1), Tree Pipit (numerous), Nubian Shrike (1).

Intra-African migrant: African Golden Oriole (3).

Seasonal movement: Yellow-billed Egret (1), Woolly-necked Stork (numerous), Cuckoo Hawk (1), Bronze-tailed Glossy Starling (8), Bristle-crowned Starling (2), Pygmy Sunbird (1), Cardinal Quelea (numerous), Black-cheeked Waxbill (1), Black-crowned Waxbill (numerous), Blue-capped Cordon-bleu (numerous).

Occasional visitor: Woodland Kingfisher (numerous), Yellow-spotted Barbet (2), Yellow-bellied Eremomela (2), Black Flycatcher (3), Gambaga Flycatcher (4).

Non-breeding resident: Brown Snake Eagle (4)*, Little Sparrowhawk (numerous), Lichtenstein's Sandgrouse (3), Black Swift (numerous), Lesser Honeyguide (numerous), Mountain Illadopsis (numerous), Lesser Swamp Warbler (numerous), Grey Apalis (numerous), Cinnamon Bracken Warbler (numerous), Mountain Yellow Warbler (numerous), Grey-capped Warbler (numerous).

*Recorded for 49D in unpublished supplement, Lewis (1989).

Extension of range — probable breeding (all numerous sightings)

Pair in suitable habitat: Hadada, Spectacled Weaver, Red-billed Firefinch Indigobird.

Building nest or nest site found: Hamerkop, African Goshawk, Pygmy Kingfisher, Tawny-flanked Prinia, Rattling Cisticola.

Singing and courtship display: Emerald Cuckoo, Narina's Trogon, Red-capped Robin Chat, Brown-headed Tchagra, Variable Sunbird.

Adults with juveniles: Augur Buzzard, Double-toothed Barbet, Yellow-rumped Seed-eater.

Adult sitting on nest but presence of eggs/chick unconfirmed: Long-crested Eagle, Hunter's Sunbird.

Extension of range — confirmed breeding (all numerous sightings)

Young in nest: Speckled Pigeon, Red-eyed Dove, Laughing Dove, Little Swift, White-rumped Swift, Green Wood Hoopoe, Spotted-flanked Barbet, Striped Swallow, Wire-tailed Swallow, Red-faced Crombec, Grey Flycatcher, African Pied Wagtail, Northern Puffback, Grey-backed Fiscal, Rüppell's Long-tailed Glossy Starling, Collared Sunbird, Grosbeak Weaver, Red-headed Weaver, Black-headed Weaver, Golden-backed Weaver, White-headed Buffalo Weaver, Grey-headed Sparrow, Red-cheeked Cordon-bleu.

Feeding young away from nest: Harrier Hawk, Black Cuckoo (Tropical Boubou), African Cuckoo (Drongo), Red-fronted Tinkerbird, Red and Yellow Barbet, Nubian Woodpecker, White-bellied Tit, Arrow-marked Babbler, Brown Babbler, Rufous Chatterer, Yellow-whiskered Greenbul, Northern Brownbul, Robin Chat, Northern Olive Thrush, Yellow-breasted Apalis, Buff-bellied Warbler, Northern Crombec, Silverbird, Tropical Boubou, Grey-headed Bush Shrike, Olive Sunbird,

Beautiful Sunbird, Green-headed Sunbird, Baglafaecht Weaver, Chestnut Weaver, African Firefinch, Red-billed Firefinch.

Incubating eggs: African Rock Martin, Spotted Morning Thrush, White-browed Robin Chat, Lead-coloured Flycatcher, Chestnut Sparrow.

Taking food to nest: Cardinal Woodpecker, African Penduline Tit, Grey-backed Camaroptera, Grey-headed Silver-bill.

Recently fledged young: Egyptian Goose, Crested Francolin, Helmeted Guineafowl, Blue-spotted Wood Dove, Tambourine Dove, White-bellied Go-Away Bird, Ross's Turaco, White-crested Turaco, Red-chested Cuckoo, White-browed Coucal, Little Bee-eater, Jackson's Hornbill, Yellow-rumped Tinkerbird, Black-throated Honeyguide, Grey Cuckoo Shrike, Black-collared Apalis, Black-throated Wattle-eye, Slate-coloured Boubou, Brubru, White-crowned Shrike, Northern Double-collared Sunbird, Little Weaver, Pin-tailed Whydah, Abyssinian Crimson-wing, Bronze Mannikin.

One hundred and eighty-three species, or more than 54 per cent of the total recorded for the area, were found to show some range extension or confirmation of former records. The relatively large number is attributed to the remoteness of the area and lack of former, continuous observer presence.

Species interaction

Nubian Woodpecker and Cardinal Woodpecker

A Cardinal Woodpecker was seen to attack a Nubian Woodpecker which had opened a termite run within the branch of a *Tipuana tipu* tree (Wilson & Wilson 1992).

Little Swift and African Rock Martin

At the beginning of the early rains each year, African Rock Martins began collecting mud and building nests under the eaves of a house. Little Swifts would drive away the martins and take over the nest, topping it out with feathers, grass and saliva as usual. Any martins' nests more than about 15 cm from an overhead structure were ignored by the swifts.

White-rumped Swift and Striped Swallow

Striped Swallows were absent throughout the survey during October and November of each year; these months corresponding to the height of the late rains. Although the birds returned to their breeding sites each December, nest repairing and breeding rarely occurred until the start of the early rains, generally in March or April of the following year. Often, after successfully rearing a brood, unoccupied nests were taken over by

White-rumped Swifts which bred continuously until the end of the late rains.

The early arrival of the rains followed by their sudden cessation in March of 1993 (see Fig 3) delayed laying by the swallows and this resulted in fierce fighting over nest rights once the swifts had arrived at their usual time.

Several observations worthy of note were made during the study. Nests just completed by swallows were stolen by swifts with little confrontation. Nests which contained eggs were vigorously defended by the swallows with the combatants often locked together, tumbling on the ground. Usually the swallows kept the nest but on one occasion both swallow and swift eggs were incubated together by a pair of swifts which ejected the young swallows a few days after hatching. Swallows which were successful in keeping their nests early in the season usually succeeded in rearing broods throughout the rains.

Red-headed Weaver and Chestnut-crowned Sparrow Weaver

While robbing a Red-headed Weaver's nest of material, a Chestnut-crowned Sparrow Weaver was attacked by the owner. A fight ensued with the Red-headed Weaver eventually being suspended in mid-air, wings closed, with its bill holding on to the tail feathers of the sparrow weaver, which, in turn, held on to the nest. After the encounter, the Red-headed Weaver abandoned the nest and the sparrow weaver showed no further interest in it.

Grey-headed Sparrow and Striped Swallow

The nests of swallows were regular targets for an influx of Grey-headed Sparrows arriving annually shortly after the start of the early rains, usually in April or May. On one occasion during May 1992, two almost fledgling-aged Striped Swallows were dragged from their nest by a pair of sparrows and killed on the ground by bill stabbing. The tunnel entrance to the nest was enlarged by the sparrows but, after some relining, was eventually abandoned without successful breeding.

Habitat preferences of similar species

Ross's Turaco, Hartlaub's Turaco and White-crested Turaco

Altitude appeared to be the main factor in separating these species. Hartlaub's was found to be in highland forest along the escarpment above 2400 m. No turacos were observed on the Turesia plateau between 2100 m and 2300 m, probably due to extensive cultivation of the area. Ross's, observed between 1450 m and 2000 m, overlapped with the White-crested which was seen between 1300 m and 1600 m. Hartlaub's inhabited the wetter west, upland areas, Ross's the intermediate and White-crested the drier to semi-arid valley floor.

Arrow-marked Babbler and Brown Babbler

These species overlapped in *Acacia* woodland at around 1400 m. The Arrow-marked,

preferring higher altitudes, was observed throughout the study in all areas with low bush. Rarely away from cover, they were common in secondary growth around *shambas* and in exotic plantations. In contrast, the Brown Babbler was observed in the drier east and regularly in the open although never far from cover.

Robin Chat and White-browed Robin Chat

Both species were found to be breeding residents in well wooded areas with much low cover. The White-browed Robin Chat was never recorded on or above the Turesia plateau (2000 m) and only during the coldest months, coincident with the rains, was the Robin Chat recorded below the Turesia plateau. The lowest record for this species was at 1500 m. No interaction between the two species was observed.

Northern Olive Thrush and African Thrush

Throughout the year the African Thrush was most common in the drier east of the region being observed up to around 1600 m. The Northern Olive preferred higher altitudes, being very common on the escarpment in areas of dense cover. Only during the cooler rains did the Northern Olive venture below 1700 m and even then was never seen below 1500 m. Where the two species overlapped, the ground appeared neutral and, since neither apparently nested between 1450 m and 1700 m, conflict never occurred with the birds appearing to totally ignore each other.

Grey Flycatcher and Pale Flycatcher

Throughout the observed area these breeding residents appeared to be separated by altitude and climate. The Grey was seen to prefer the drier east below 1400 m while the Pale was observed in the wetter west generally above 1500 m. During certain periods very local movement was observed with the Pale often observed down to 1350 m where it was sympatric with the Grey during the rains. During the driest months the Grey in turn increased its altitude range, being seen regularly with the Pale up to 1600 m.

Breeding

Breeding records

Breeding seasons were compared with Brown & Britton (1980) and, although many were found to be in agreement, Table 2 lists those species for which there were no records available and those showing marked discrepancy or extended periods.

Table 2. *Breeding seasons of confirmed species*

Key

Solid line: Brown & Britton (1980)

Grey shading: current study

Species/month	J	F	M	A	M	J	J	A	S	O	N	D
Chinspot Batis												
Northern Puffback												
Black-headed Gonolek												
Tropical Boubou												
Slate-coloured Boubou												
Grey-headed Bush Shrike												
Sulphur-breasted Bush Shrike												
Brubru												
White-crowned Shrike												
Violet-backed Starling												
Collared Sunbird												
Amethyst Sunbird												
Olive Sunbird												
Green-headed Sunbird												
Yellow White-eye												
Grosbeak Weaver												
Red-headed Weaver												
Golden-backed Weaver												
Little Weaver												
Chestnut-crowned Sp Weaver												
Chestnut Sparrow												
Pin-tailed Whydah												
Red-billed Firefinch												
Bronze Mannikin												
Grey-headed Silverbill												

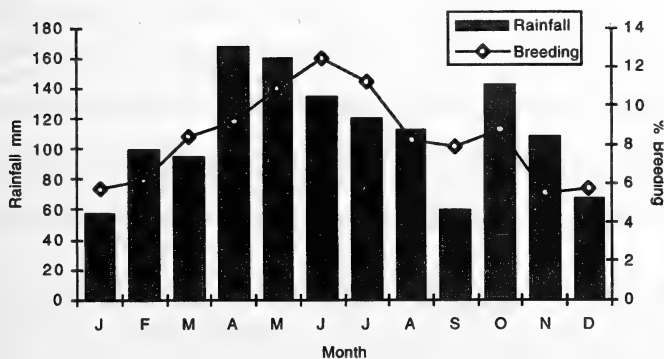


Figure 14. Mean of monthly rainfall and percentage of total species breeding

Figure 14 gives the percentage of the 127 confirmed breeding residents super-imposed upon a graph of the mean monthly rainfall for the survey period. From the figure it is apparent that breeding is triggered by the onset of the early rains peaking after the heaviest falls. A decline with diminishing precipitation can be seen as can a secondary smaller peak during the late rains. Although the June peak of only 4 per cent above a breeding mean of 8.3 per cent may appear small, 75 per cent of the total species were seen to breed during the rains.

Notes on selected species

Speckled Pigeon Described by Brown & Britton (1980) as a breeding resident with a decline during the rains. Unfortunately this could not be assessed for birds breeding on the escarpment; but on the drier valley floor at 1350 m, where the species is a common breeding resident, a decline was noted during the dry season. This was thought due to radiant heat within the roof of the corrugated steel buildings where the pigeons nest. This increase in temperature, well above ambient during the dry season, was thought to be too great for the birds to endure. Conditions improved for breeding during the cooler rains.

Black Cuckoo This species was most prevalent throughout the early rains, a juvenile observed during the first 11 days of July 1990 being fed by its Tropical Boubou foster parent.

African Cuckoo Observed as a juvenile present throughout June 1992. The first sighting was on 11 June when the cuckoo was fed by both foster-parent Drongos. Later in the month the bird was seen hunting in the manner typical of a Drongo, perching conspicuously and darting out for food in flight or alighting to catch a prey on the ground, returning to the same favourite perch.

Lead-coloured Flycatcher On 12 March 1993 a pair was seen taking nesting material to a former Nubian Woodpecker nest hole 5.5 m above ground, in a telegraph pole at 1450 m above sea level. Incubation began on about 19 March leaving the west-facing nest hole unattended during the heat of the afternoon. It was at such a time that the opportunity was taken to record the nest and eggs (Wilson & Wilson 1994).

African Pied Wagtail In 1992 a pair built their nest at floor level on a walkway within the main plant adjacent to grinding mills, subjecting their two chicks (successfully reared from three eggs laid on 17 January) to continuous noise of over 100 dB.

Grosbeak Weaver Until October 1990 this species was unrecorded in the area. During early 1990 one of the lagoons was drained leaving a central area of fine, wet silt which provided ideal growing conditions for an expanse of dense *Typha*. During December 1990 the first weavers were noted in the *Typha* and by 1992 a colony of some 20 pairs was present. During 1993, a second, smaller lagoon was also drained with the same result, increasing the population of weavers by around 50 per cent.

Miscellaneous observations on selected species

Hoopoe Hoopoes are never common although their numbers increase between September and April when the nominate race is present. Only during September and October are *Upupa e. epops* and *U. e. africana* sympatric, with the latter unrecorded between November and April annually.

Lesser Honeyguide On 9 February 1990 a Lesser Honeyguide being pursued by Common Bulbuls became impaled on a prickly pear cactus *Opuntia vulgaris*. Although impaled through the pectoralis major muscle, the bird was able to fly after being rescued.

Striped Swallow During May 1992 two pairs built a communal (single chamber) nest with two entrance tunnels. During April 1993 Striped Swallows built a nest using mud from different site areas leaving the dried construction showing the building pattern in the form of definite colourful concentric bands.

African Penduline Tit and Mouse-coloured Penduline Tit The African Penduline Tit was found to be a breeding resident within the area while the Mouse-coloured Penduline Tit was apparently a wanderer recorded only once. This is in contrast to observations, both personal and by Stevenson (1980) at nearby Baringo where the Mouse-coloured is the breeding resident and the African the visitor.

Common Bulbul, On 8 December 1989 a Common Bulbul was observed being particularly harassed by others of the same species. On closer examination the bird was seen to have a white base to the bill and prominent white eye-ring on both sides of the head (Wilson 1994). Apart from these obvious differences and a more skulking nature, the bird was as *P. barbatus*. Although similar to the southwest Asian race *xanthopygos*, the eye-ring was markedly wider, being estimated at 2 mm.

Red-capped Robin Chat This chat was only spasmodically recorded during 1989 and 1990 and only at around 1550 m in ravine woodland. During 1991 and 1992 it was recorded more often, being observed between 1350 m and 1650 m [FW] always in well wooded areas. In 1993, although the species was first observed in January, it was heard daily between March and June singing from the same area of woodland. An almost instant response was seen to tape playback when the true call was recorded whereas playback of its own mimicry had little or no effect. Unfortunately no nest site has been found, the species being categorized as 'probably breeding resident'.

Northern Puffback and Jameson's Mamba *Dendroaspis jamesoni* On 28 July 1992 a Jameson's Mamba was moving in a tree adjacent to a *Pappea capensis*, in which a female Northern Puffback was incubating eggs, when it came under attack from the male puffback. While the snake was preoccupied by other birds which surrounded it, the puffback alighted and, lifting the tip of the snake's tail in its bill, took off again. The bird rose a good 10 cm before the weight became too much for it, when the tail was dropped. This was repeated three times before the snake moved away.

Lesser Grey Shrike Generally regarded as a northerly passage migrant in Kenya (Britton 1980). Two were recorded on southerly passage 29 September and 19 October 1991, both remaining only until around midday when the weather cleared sufficiently for the birds to leave the valley.

Nubian Shrike Probably the tenth record for Kenya (D. A. Turner, pers. comm.) the shrike was recorded on 31 October 1992 as part of a fall with Eurasian Bee-eaters, Eurasian Rollers, Golden Orioles and Red-backed Shrikes. Believed to have been attracted to the mine lights during adverse weather.

Bronze-tailed Glossy Starling 1989 was a particularly wet year with 1524 mm of precipitation recorded at 1400 m. Many trees which generally have little fruit were seen to crop exceptionally heavily during January 1990, especially so *Pappea capensis* which attracted hundreds of feeding Blue-eared Glossy Starlings to the area. On eight days, around 50 of these starlings visiting one particular tree had, in association, five Bronze-tailed Glossy Starlings. The spectacle of so many starlings together and observation of the Bronze-tailed was not repeated during the survey period.

Superb Starling In May 1993 a pair of Superb Starlings completely lined their nest with fibre-glass insulation material.

Amethyst Sunbird These sunbirds were often observed stealing feathers for nest lining from the outer surface of Little Swifts' nests. The sunbirds' nests were in turn raided by Chestnut-crowned Sparrow Weavers.

Red-billed Firefinch Indigobird Although this species is an uncommon resident of lowland below 1350 m, seasonal influxes towards the end of the early rains coincide with the breeding of its known host, the Red-billed Firefinch. At this time an estimated (from males in breeding plumage with accompanying females) 40 pairs are usually present within an area of 8 km².

Changing habitat

Before the mining company constructed an all-weather road down the escarpment in 1971 and bridged the Mong River, direct access to the area was on foot. Over the past 20 years former subsistence farming has been over-shadowed by improved agriculture due to improved accessibility to the Turesia plateau and valley floor. During the survey period, this development continued to accelerate with an ever increasing influx of people to the area. Well tended *shambas* now surround the airstrip replacing former bush and woodland. This pressure is beginning to show throughout with over-grazing on the valley floor and seasonal burning on the hillsides resulting in increased erosion during the rains. However, bush clearing for charcoal burning or extension of farmland, which has caused major loss of soil on other parts of the valley floor (Kipkorir, Soper & Ssenyonga 1981), has not yet had such a drastic effect within the surveyed area. The agriculture of the Turesia plateau is, however, spreading both

towards the valley floor and up into the remaining fragmented forest. But, as the escarpment is approached, the danger from landslides becomes all too apparent: there have been several large falls already. A thin ribbon of forest-type vegetation should therefore remain because of the threat of rockfall; the gathering of firewood from within the area is still practised. A comprehensive irrigation scheme has been proposed for the valley floor, including the damming of the Kimwarer River above the escarpment. Should this happen, even greater pressure would be placed on the natural environment, not only from the land clearance necessary to make the venture economic, but also from the increased human population the water would support.

Evidence portraying the general change in habitat is best exemplified by the species observed throughout the period. Quelea and Cardinal Quelea, unrecorded early in the survey, were later relatively common in flocks visiting the recently developed *shamba* area around the airstrip, especially just prior to harvesting. These visitors brought with them their attendant predators with African Goshawk and Black-shouldered Kite often being seen. Streaky Seed-eater, initially unrecorded below the Turesia plateau, was later regularly observed to as low as 1600 m due, it is believed, to the increase in land cleared for *shambas* at this altitude.

Throughout the survey period the lagoons on the valley floor provided a varied habitat for numerous species. Lagoons were present in all stages of development from expanses of open water, attracting swifts and swallows hawking for insects, to filled and dry, overgrown with dense *Acacia* bush and trees. A partially filled lagoon had mud banks attracting waders and storks and one drained during the survey period was quickly overgrown with *Typha* providing an ideal nesting site, soon exploited by Grosbeak Weavers. At a further stage of development, one completely dried lagoon was covered with grass and *Acacia* scrub and small trees attracting Little Bee-eater, Pin-tailed Whydah, Grey-headed Silver-bill, and nesting Golden-backed Weavers. One overgrown lagoon, at the time of writing some ten years old, supported *Acacia* to five or more metres, providing habitat for various species including Yellow-breasted Apalis, doves, White-bellied Go-away Bird and Hoopoe. Dense undergrowth beneath the trees gave sanctuary to skulking species such as Northern Brownbul, Slate-coloured Boubou and Spotted Morning Thrush. The plant buildings provided nest sites for species otherwise unlikely to be found on the valley floor such as Speckled Pigeon, Little Swift, African Rock Martin and Wire-tailed Swallow.

Once the deposit becomes exhausted, the mine will close and much of the artificial habitat will be lost. The plant buildings will be demolished for their structural steel content and the lagoons will totally dry and revert to *Acacia* woodland. Since this will result in all tall buildings and large expanses of open water disappearing from the area, many of the observed species, both resident and migratory are expected to go unrecorded in the future.

Addendum

Species accounts

Species of interest observed since July 1993.

ACCIPITRIDAE

Eurasian Marsh Harrier *Circus aeruginosus* 92, 97: (B 6) single 11 Feb 94.

Long-legged Buzzard *Buteo rufinus* 123, 118: (D 2) three, with other birds of prey, 23 Oct 1994.

FALCONIDAE

Lesser Kestrel *Falco naumanni* 156, 160: (B 9) pair 7 Nov 1993.

Hobby *Falco subbuteo* 160, 152: (C 4) adult 1 Nov 1993.

PHASIANIDAE

Hildebrandt's Francolin *Francolinus hildebrandti* 171, 166: (D 1) single adult female 26 Oct 1994.

CAPRIMULGIDAE

Freckled Nightjar *Caprimulgus tristigma* 439, 403 (D 4): remains of an adult found 30 Jan 94.

CORVIDAE

Pied Crow *Corvus albus* 654, 577: (C 4) 7 May 1994.

SYLVIIDAE

Marsh Warbler *Acrocephalus palustris* 809, 693: (C 4) single 21 Nov 1993.

LANIIDAE

Woodchat Shrike *Lanius senator* 1038, 860: (B 9) immature, 25 Sep 1994.

ESTRILDIDAE

Green-backed Twinspot *Mandingoa nitidula* 1242, 1014: (C 4) single 20 Dec, pair 21 Dec 1993 and single 10 Aug 1994.

FRINGILLIDAE

Yellow-fronted Canary *Serinus mozambicus* 1290, 1056: believed resident on Turesia plateau.

Changing habitat

Since the completion of the survey, Sector C 4 (Region A) has been altered significantly in that much of the *Dodonaea augustifolia* and *Teclea* has been destroyed in the making of a *shamba*, forcing such species as Narina's Trogon and Red-capped Robin Chat into more open, nearby garden areas. This is also probably the reason for the recent observation of Green-backed Twinspot.

Acknowledgements

We wish to thank R.H. Berry [RHB] for additional records and company on many survey excursions; F. Wilson [FW] for records and additional identification of plant species; T.M. Mereng (KFC) for climatic information; G. Macdonald for compilation of species data; and G.C. Backhurst for suggestions and the supply of an unpublished *Atlas* supplement. We also thank G.C. Backhurst, D.A. Turner and an anonymous referee for critically reading the draft.

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Short communications

Recent records of the Blue Quail *Coturnix chinensis* from Tanzania

This widespread but seemingly local species is perhaps under-recorded due to its preference for long-grass habitats and the difficulty in getting it to flush. Fewer than five birds have been recorded during the past 30 years in Tanzania, probably due to a reduction in the number of observers rather than a decline in actual numbers. Also, there has certainly been a change in field techniques: nowadays, fewer observers walk and fewer still use dogs to flush birds. The Tanzania Atlas Project has the following three recent Blue Quail records on file:

1. An adult male ringed at Mikumi village on 24 December 1990 by A.D. Bramley. The bird was caught in atypical habitat and may have been attracted to lights while moving at night. It weighed 33 g at 11:00 with a winglength of 72 mm.
2. An adult male was flushed from a long-grass *dambo* in Ruvu South Forest Reserve, 35 km southwest of Dar es Salaam on 17 October 1993. The small size and dark plumage, with rufous on the upper wing identified the species as it flew above the grass and dropped to ground some 20 m away.
3. On 10 May 1991 a dead 'quail' was found in Bukoba on the western shore of Lake Victoria. The specimen was kept in a freezer until we could view it in November 1993, when we confirmed that it was indeed a Blue Quail. The bird probably died by hitting a window while moving at night. We thank Dr Chris Bosche for retaining the specimen and allowing us to examine it.

N.E. Baker and E.M. Baker, Box 23404, Dar es Salaam, Tanzania

Scopus 18: 116, December 1994

Received 24 January 1994

Zanzibar records of Arctic Skua *Stercorarius parasiticus* and Pomarine Skua *S. pomarinus*

On 19 January 1994, 1 km off shore and southwest of Zanzibar town, we observed a subadult (or possibly adult) light morph Pomarine Skua *Stercorarius pomarinus* chasing, back and forth, a flock of Crested Terns *Sterna bergii*. Despite the rolling of our boat, the deep wings and stoutly-built body were striking. While the flight was heavier and more powerful than that of an Arctic Skua *S. parasiticus*, no protruding central tail feathers could be seen. Fresh and dark inner primaries contrasted strongly with light brown old outer primaries and a light brown band across the inner wing formed by the light bases of the old secondaries; old secondary coverts were lacking. This upper-wing pattern closely resembled the second-winter light morph Pomarine

Skua we had caught on the beach at Chumbe Island, about 12 km south-southwest of Zanzibar town, which represented the first record of the species for Tanzania (Koehler & Koehler 1993).

A subadult light, or barred morph Arctic Skua was washed ashore on 14 March 1994 on Chumbe Island following a heavy storm. It was released after being photographed by Ilona Riehl and Günther Bludszweit. The photographs show an individual probably in its third calendar year and moulting from the second immature non-breeding to breeding plumage. Primaries 1–8, many wing coverts and rectrices 1 and 2 are dark brown and new, the sharply pointed central pair of rectrices protruding 30–40 mm beyond the old outermost one. All secondaries were old. According to Urban *et al.* (1986) this might represent the first record of Arctic Skua for Tanzania.

While we are not completely sure of the ageing criteria of the Pomarine Skua seen on 19 January, the two immature skuas can be presumed to have been going to spend the summer as non-breeders in the Indian Ocean as virtually only adults are seen on spring migration off Eilat, Israel (Meininger & Sorensen 1986).

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Scopus 18: 116–117, December 1994

Received 8 August 1994

The birds of Ajai's Game Reserve, Uganda: a first ornithological survey

A biological assessment of Ajai's Game Reserve, central West Nile Region, was undertaken by Frontier-Uganda, a scientific collaboration between the UK-based Society for Environmental Exploration and the Uganda Game Department. An ornithological survey, carried out between 15 October and 12 December 1993 identified 115 species from 40 families.

Study area

Ajai's Game Reserve (2°45'–3°00'N, 31°05'–31°25'E) covers 158 km². The northern and eastern areas are predominantly low-altitude (<700 m) wooded savanna grading to permanent swamp. In the south of the reserve a ridge (to 850 m) rises out of wooded savanna, supporting dry grassland on its northeastern slope. Two tributaries of the River Nile flow through the reserve feeding a range of wetland habitats which include 34 km² of permanent papyrus swamp. Human encroachment, an increasing problem, has led to about 6 per cent of the reserve being under cultivation.

Methods

Bird observations were made in five broad vegetation types occurring within the reserve: wooded savanna, riverine woodland, papyrus swamp, swamp grassland and woodland (Langdale-Brown *et al.* 1964). On two occasions the swamp grassland between the eastern boundary of the reserve and Rhino Camp, a small town on the River Nile, was visited.

Species identification was by visual observations supported for some species by the recognition of calls. Mist-netting was not carried out. Once determined, each vegetation type was sampled on foot. These bird walks of between 6 and 8 km on average, were carried out on a daily basis between 07:00–10:30 and between 17:30–18:30 at least three times each week, though all opportunistic sightings were also recorded. Fifty-four per cent of observations were made in wooded savanna, and almost 40 per cent made in the wetland habitats of papyrus swamp, swamp grassland and riverine and riverine woodland. Approximately half of the study time was spent in the wooded savanna, the most extensive vegetation type in the reserve. Access to the papyrus swamp was limited, though vantage points such as bridges were used during the study.

Results

A total of 115 species were recorded between 22 October and 5 December 1993. Species abundance was higher in transitional zones between the five distinct habitats, with diversity enhanced in wetland areas. Cultivation also had a positive effect on the variety of species.

Table 1. *Birds of Ajai's Game Reserve, 22 October–5 December 1993*

Key: Habitat type: AT: all types, PS: papyrus swamp, RW: riverine woodland, WS: wooded savanna, SG: swamp grassland, RC: Rhino Camp, SFG: seasonally flooded grassland, SFWG: seasonally flooded wooded grassland, R: riverine, SWS: swampy wooded savanna, W: woodland, HH: human habitation. **Frequency:** 1: seen daily, 2: seen at least once a week, 3: seen at least three times during the study

Species	habitat	frequency
White Pelican <i>Pelecanus onocrotalus</i>	PS	3
Long-tailed Cormorant <i>Phalacrocorax africanus</i>	PS	3
Greater Cormorant <i>P. carbo</i>	PS	2
Dwarf Bittern <i>Ixobrychus sturmii</i>	PS	2
Grey Heron <i>Ardea cinerea</i>	SG, RC	2
Goliath Heron <i>A. goliath</i>	PS	3
Black-headed Heron <i>A. melanocephala</i>	SG, RC	2
Purple Heron <i>A. purpurea</i>	PS	3
Squacco Heron <i>Ardeola ralloides</i>	PS	3
Green-backed Heron <i>Butorides striatus</i>	PS	2
Little Egret <i>Egretta garzetta</i>	RW	3
Hamerkop <i>Scopus umbretta</i>	RW	2
Open-billed Stork <i>Anastomus lamelligerus</i>	RW	1
Abdim's Stork <i>Ciconia abdimii</i>	WS	3
Woolly-necked Stork <i>C. episcopus</i>	SFG	3

Species	habitat	frequency
Saddle-billed Stork <i>Ephippiorhynchus senegalensis</i>	PS	3
Marabou Stork <i>Leptoptilos crumeniferus</i>	AT	2
Hadada Ibis <i>Bostrychia hagedash</i>	WS	2
Lappet-faced Vulture <i>Torgos tracheliotus</i>	RW	3
African Harrier Hawk <i>Polyboroides radiatus</i>	WS	3
Bateleur <i>Terathopius ecaudatus</i>	WS	1
Wahlberg's Eagle <i>Aquila wahlbergi</i>	WS	3
Common Buzzard <i>Buteo buteo</i>	WS	3
Long-crested Eagle <i>Lophaelus occipitalis</i>	WS	2
Gabari Goshawk <i>Melierax gabar</i>	WS	3
Dark Chanting Goshawk <i>M. metabates</i>	WS	1
Martial Eagle <i>Polemaetus bellicosus</i>	WS	2
Fish Eagle <i>Haliaeetus vocifer</i>	RW	2
Black Kite <i>Milvus migrans</i>	AT	1
Black-shouldered Kite <i>Elanus caeruleus</i>	WS, RC	3
Helmeted Guinea-fowl <i>Numida meleagris</i>	WS	1
Crowned Crane <i>Balearica pavonina</i>	SG	3
Black Crake <i>Limnocorax flavirostris</i>	PS	2
Jacana <i>Actophilornis africanus</i>	SG, RC	3
Wattled Plover <i>Vanellus senegallus</i>	WS	2
Black-headed Plover <i>V. tectus</i>	SG	2
Namaqua Dove <i>Oena capensis</i>	WS	3
Ring-necked Dove <i>Streptopelia capicola</i>	WS	1
Black-billed Wood Dove <i>Turtur abyssinicus</i>	WS	2
Green Pigeon <i>Treron australis</i>	WS	1
Brown Parrot <i>Poicephalus meyeri</i>	WS	1
Bare-faced Go-away-bird <i>Corythaixoides personata</i>	WS	2
Eastern Grey Plantain-eater <i>Crinifer zonurus</i>	AT	1
White-crested Turaco <i>Tauraco leucocephalus</i>	RW	3
Levaillant's Cuckoo <i>Clamator levaillantii</i>	WS	3
Blue-headed Coucal <i>Centropus monachus</i>	WS	3
Senegal Coucal <i>C. senegalensis</i>	WS	2
White-browed Coucal <i>C. superciliosus</i>	WS	1
Pearl-spotted Owllet <i>Glaucidium perlatus</i>	RW	3
Pel's Fishing Owl <i>Scotopelia peli</i>	R, PS	3
Palm Swift <i>Cypsiurus parvus</i>	WS	1
Speckled Mousebird <i>Colius striatus</i>	WS	1
Blue-naped Mousebird <i>Urocolius macrourus</i>	WS	1
Pied Kingfisher <i>Ceryle rudis</i>	R	3
Malachite Kingfisher <i>Alcedo cristata</i>	R	1
Striped Kingfisher <i>Halcyon chelicuti</i>	SWS	2
Chestnut-bellied Kingfisher <i>H. leucocephala</i>	RW	2
Woodland Kingfisher <i>H. senegalensis</i>	WS	2
Red-throated Bee-eater <i>Merops bullocki</i>	RW	2
Swallow-tailed Bee-eater <i>M. hirundineus</i>	WS	2
Little Bee-eater <i>M. pusillus</i>	SG	3
Abyssinian Roller <i>Coracias abyssinica</i>	S, WS	3
Lilac-breasted Roller <i>C. caudata</i>	WS	3
Green Wood Hoopoe <i>Phoeniculus purpureus</i>	W	3
Red-billed Hornbill <i>Tockus erythrorhynchus</i>	WS	3
Grey Hornbill <i>T. nasutus</i>	WS	1
Abyssinian Ground Hornbill <i>Bucorvus abyssinicus</i>	WS	2

Species	habitat	frequency
Double-toothed Barbet <i>Lybius bidentatus</i>	WS	2
Spotted-flanked Barbet <i>L. lacrymosus</i>	WS	3
White-headed Barbet <i>L. leucocephalus</i>	WS	3
Black-throated Honeyguide <i>Indicator indicator</i>	WS	3
Cardinal Woodpecker <i>Dendropicos fuscescens</i>	RW	2
Grey Woodpecker <i>Mesopicos goetae</i>	RW	2
Bearded Woodpecker <i>Thripias namaquus</i>	RW	3
Wire-tailed Swallow <i>Hirundo smithii</i>	WS	2
Sand Martin <i>Riparia riparia</i>	WS	2
Drongo <i>Dicrurus adsimilis</i>	AT	1
Pied Crow <i>Corvus albus</i>	HH	1
Common Bulbul <i>Pycnonotus barbatus</i>	AT	2
White-browed Robin Chat <i>Cossypha heuglini</i>	WS	3
Red-capped Robin Chat <i>C. natalensis</i>	WS	1
Yellow-bellied Eremomela <i>Eremomela icteropygialis</i>	WS	3
Black Flycatcher <i>Melaenornis edolioides</i>	WS	3
Wattle-eye <i>Platysteira cyanea</i>	RW	3
Paradise Flycatcher <i>Terpsiphone viridis</i>	RW	2
Black-headed Gonolek <i>Laniarius barbarus</i>	WS, RW	1
Black-headed Tchagra <i>Tchagra senegala</i>	WS	3
Fiscal Shrike <i>Lanius collaris</i>	WS	1
Grey-backed Fiscal <i>L. excubitorius</i>	WS	1
White-crowned Shrike <i>Eurocephalus rueppelli</i>	WS	2
Helmet Shrike <i>Prionops plumata</i>	WS	2
Bronze-tailed Glossy Starling <i>Lamprotornis chalcurus</i>	WS	1
Lesser Blue-eared Glossy Starling <i>L. chloropterus</i>	WS	3
Purple Glossy Starling <i>L. purpureus</i>	WS	2
Rüppell's Long-tailed Glossy Starling <i>L. purpuropterus</i>	WS	1
Olive-bellied Sunbird <i>Nectarinia chloropygia</i>	WS	3
Red-chested Sunbird <i>N. erythroceria</i>	SG	3
Grosbeak Weaver <i>Amblyospiza albifrons</i>	PS	3
Red-headed Weaver <i>Anaplectes rubriceps</i>	WS	3
Parasitic Weaver <i>Anomalospiza imberbis</i>	RW	3
Northern Red Bishop <i>Euplectes franciscanus</i>	WS	1
Black-winged Red Bishop <i>E. hordeaceus</i>	WS	3
Red-headed Malimbe <i>Malimbus rubricollis</i>	WS	3
Black-headed Weaver <i>Ploceus cucullatus</i>	R	2
Masked Weaver <i>P. intermedius</i>	AT	1
Yellow-backed Weaver <i>P. melanocephalus</i>	PS	2
Spectacled Weaver <i>P. ocularis</i>	R	2
Slender-billed Weaver <i>P. pelzelni</i>	RW	3
White-browed Sparrow Weaver <i>Plocepasser mahali</i>	WS	1
Pin-tailed Whydah <i>Vidua macroura</i>	WS	1
Common Waxbill <i>Estrilda astrild</i>	WS	3
African Firefinch <i>Lagonosticta rubricata</i>	RW	2
Red-billed Firefinch <i>L. senegala</i>	WS	2
Red-cheeked Cordon-bleu <i>Uraeginthus bengalus</i>	AT	1
Black and White Mannikin <i>Lonchura bicolor</i>	WS	3

Additional notes on two uncommon species

Pel's Fishing Owl *Scotopelia peli*

One was seen on two occasions from a bridge in papyrus swamp. On the first sighting (12 November, 18:30–18:45) the bird was flying about 10 m up from a small patch of riverine woodland over the river and swamp to a patch of forest approximately 40 m from the river. It was then watched sitting on an open branch about 7 m above the ground until the light was lost. On the second occasion (14 November, 17:30–17:45) the owl was flying between 5–7 m above the swamp carrying prey with both feet. The prey was an object about 15 cm long and was not recognizable as a fish. The bird flew to another open branch in the same patch of riverine woodland fringing the papyrus swamp, about 50 m from the observers. The bird waited on this branch for about 10 min with its back towards us, though its head was turned to face us. The arrival of other people on the bridge disturbed the owl which turned its body round to face us for about a minute before flying off into dense *Phoenix reclinata* swamp forest. A full description has been lodged with the EANHS OS-c. Ajai's would appear to be the third locality for this species in Uganda (Britton 1980, Ash *et al.* 1991).

Red-billed Hornbill *Tockus erythrorhynchus*

One was observed twice in one day in wooded savanna in the central eastern part of the reserve (27 October). The only previous record (unpublished) was of one seen at Inde (a village within the reserve) in May 1969.

Discussion

The 115 species recorded is a minimum estimate as species seen but not positively identified have been omitted. Further species of nightjars, swallows, warblers and sunbirds, for example, can be expected with more observation. Local Game Department staff stated that the Shoebill *Balaeniceps rex* was found in the reserve.

The association of vegetation types, particularly wetland habitats, provides a suitable environment for a rich and varied bird population. Originally established as a white rhinoceros *Ceratotherium simum* sanctuary, there is strong local feeling that, with the extinction of this species, the reserve serves no purpose and should be turned over to agriculture. The protected status of Ajai's, if revoked or reduced in the proposed review of Uganda's protected area system, should provide for the preservation of a mosaic of swamp, riverine woodland and wooded savanna as refugia amidst areas of increasing human influence.

Acknowledgements

Without the field support of the Frontier UG10 field expedition this work would not have been possible. I thank Prof Derek Pomeroy of Makerere University, Kampala, Dr Lincoln Fishpool of BirdLife International, Cambridge and Dr Neil Burgess of the Royal Society for the Protection of Birds for advice and criticism of the first draft of this communication.

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Scopus 18: 117–122, December 1994

Received 11 October 1994

Dusky Long-tailed Cuckoo *Cercococcyx mechowi* and Papyrus Canary *Serinus koliensis*: two additions to the Tanzania list

During atlas fieldwork in Kagera Region, northwest Tanzania, two species were found that had not previously been identified in the country.

Dusky Long-tailed Cuckoo *Cercococcyx mechowi*

A bird was resident around our camp in Minziro Forest Reserve (1°07'S, 31°30'E) from 16 to 23 November 1993. Its call was initially noticed by Bro A. Grawehr who likened it to that of the Black Cuckoo *Cuculus clamosus* with which he is familiar in southern Tanzania. It became a familiar call around the camp, especially in the early mornings and late afternoons. The bird was seen several times but we were aware of the difficulties in separating this species from the Olive Long-tailed Cuckoo *Cercococcyx olivinus* in the field. Several of the party were familiar with the Barred Long-tailed Cuckoo *C. montanus* in the field and in the hand.

On 21 November the bird was finally caught in a mist net placed deliberately close to the forest edge where it had been seen. On 26 and 27 November further birds were caught at Kikuru Forest Reserve some 14 km east of Minziro. The relevant mensural data (g and mm) are as follows:

<u>Bird No.</u>	<u>mass</u>	<u>wing</u>	<u>bill</u>	<u>tarsus</u>	<u>tail</u>
1	51.6	146	24.5	20.2	205
2	59	150	24.2	20.4	200
3	47	140	23.8	—	200

The species is known from adjacent forest areas in Uganda. These records are not, therefore, significant extensions of range.

Papyrus Canary *Serinus koliensis*

Two birds were mist-netted along the edge of a papyrus swamp near Katera village (1°20'S, 30°40'E) on 1 December 1993. The site was in the vicinity of Kagera Swamp and only 2 km from the Rwandan border. The species is known from the Kagera Swamp in Rwanda and is not, therefore, a significant extension of range.

Full details have been submitted to the East African Rarities Committee, which has accepted both records.

We wish to thank Peter Robinson for checking the skins of both species in the British Museum.

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Scopus 18: 122–123, December 1994

Received 14 June 1994

A roost of Swallow-tailed Kites *Chelictinia riocourii* and Lesser Kestrels *Falco naumanni* near Naro Moru, Kenya

The D448 road which leads from Naro Moru on the western slopes of Mt Kenya to join the B5 Nyeri to Nyahururu road, and which borders the southern edge of Solio Game Park, is excellent for birds of prey at the appropriate season, particularly harriers *Circus* spp., and Lesser and White-eyed Kestrels *Falco naumanni* and *F. rupicoloides*.

During the late afternoon of 9 March 1993, we were driving slowly along this road watching several Lesser Kestrels hunting and sitting on fences, when a flock of the same species appeared alongside the vehicle. We disembarked to count them (40 birds) and as we watched noticed several white birds, very high in the sky to the north, 'flashing' against a large black thundercloud. At first we thought they might be White-winged Black Terns *Chlidonias leucopterus* but as they drifted nearer and started to descend, it became obvious that they were Swallow-tailed Kites *Chelictinia riocourii*. The straggling line of birds continued towards us and began to drop into a clump of large trees some 300 m south of the road. To our amazement, these trees were already full of Lesser Kestrels and many Swallow-tailed Kites. A small flat-topped acacia some little way beyond the large trees was covered with kites and the whole sloping top appeared white. This was presumably a pre-roosting place as the kites eventually left to join the others in the large trees. All the birds would occasionally take flight and mill about and it was during this activity that we were able to count and estimate their numbers as they re-settled. We were satisfied that at least 250 Swallow-tailed Kites and 600 Lesser Kestrels were present.

The following day, in an attempt to be at the site before the birds arrived so that we could count them in, we arrived at 16:30 to find the small acacia already "white" with kites and others, together with Lesser Kestrels, in the larger trees. The kestrels were approaching from the north and west and between 18:15 and 19:05 we counted 400 as they crossed the road to join the roost, including a concentrated 90 birds which arrived between 18:55 and 19:00. We managed to count 148 kites as they milled around the trees and estimated that at least 250 were again present, with 600 Lesser Kestrels and three Black-shouldered Kites *E. caeruleus*. We were not able to count any birds which may have entered the roost from the south. Also in the area on 10 March were seven Eurasian Marsh Harriers *Circus aeruginosus*, three Montagu's Harriers *C. pygargus* and one White-eyed Kestrel.

It was interesting to speculate on how long the kites had been in the area; perhaps the roost was just a transitory migrant assembly. Whatever the answer, it would have been interesting to know how far the kites dispersed to feed and why they approached the roost at such a height. Three days later, on 12 and 13 March, in Meru National Park, we had seven and 15 sightings of Swallow-tailed Kites respectively; clearly there were many more in this part of Kenya than is usual. The whole experience was quite spectacular.

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Scopus 18: 123–124, December 1994

Received 22 October 1994

The Angola Swallow *Hirundo angolensis* nesting in the Impenetrable Forest, Uganda

The Angola Swallow *Hirundo angolensis* is a common species in open areas around and within the Bwindi-Impenetrable Forest National Park, southwest Uganda. From September 1986 through August 1987 I monitored all nests of *H. angolensis* on three buildings at the Ruhizha Forest Station (1°02'S, 29°46'E) of the then Impenetrable Forest Reserve. Ruhizha is at 2300 m a.s.l. and receives an annual rainfall of about 144 cm (range 113–239 cm). The station is surrounded by montane forest but an extensive region of intensively cultivated land lies off the northern boundary about 1 km away. The climate, vegetation and fauna of this area are described by Butynski (1984).

Twenty-one nests were monitored. All nests were constructed of mud and grass plastered on to the walls of the buildings 3.5–6 m above the ground. All were located under eaves and, therefore, well protected from rain, wind and predators. The greatest distance between any two nests was about 30 m. During the nesting period, the usually rather silent adult birds became noisy, giving loud chirps and twitters. This was particularly noticeable at first light (c. 06:30).

The nests and eggs were as described by Chapin (1953), Mackworth-Præd & Grant (1960) and Keith *et al.* (1992). That is, the nests were made of mud and grass, cup-shaped, and lined with grass and feathers. The eggs were white, blotched with dark rufous/rusty brown.

The mean number of eggs in 21 clutches under incubation was 2.76. This is probably an underestimate as some eggs may have been lost prior to the start of incubation. In the nine nests monitored prior to laying and up to the start of incubation, the mean number of eggs/clutch was 2.89. All nests had two to three eggs, with three eggs being the norm. Eggs were usually laid on consecutive days and incubation began soon after the last egg was laid.

The number of nestlings hatching in 20 nests was 40. This gives a mean of 2.00 nestlings/nest. Thus, about 69 per cent of the eggs laid hatched. One nest with three

eggs was excluded from this analysis as it was built in a cookhouse and probably failed because of the extremely smoky conditions.

Seventeen nests were observed until the nestlings either died or fledged. Four of the 17 nests did not fledge any young. Mean number of young fledged per nest was 1.80. Thus, approximately 62 percent of the eggs laid, and 90 percent of the eggs hatched, resulted in fledged young.

The incubation period for seven nests was 17–18 d. Nestlings are in the nest for 22–27 d ($n = 11$ nests, mean = 23 d). The entire nesting period, from the start of laying through fledging, ranged from 42–48 days with a mean of about 43 d.

Most of the nests at Ruhizha were used three times during this one-year study. The birds were not banded so it is uncertain whether the same individuals made three nesting attempts, but this was presumably the case. There was considerable synchrony among nesting *H. angolensis* at Ruhizha. The seven nests monitored during the first nesting hatched chicks between 22 October and 3 November (median 28 October, middle of the short wet season). Second nesting, three nests, 30 December–4 January (median 1 January, start of the short dry season). Third nesting, six nests, 2–13 August (median 7 August, middle of the long dry season). There were 65 d between the first and second hatchings and 219 d between the second and third hatchings. No nests were active during the intervening periods.

There was almost no rain from mid-June through mid-August 1987. Breeding at this time, and under these conditions, is at odds with Brown & Britton (1980) (56 records) who state that "Breeding is virtually confined to the rains when insect life is abundant and mud for nest-building is readily available."

The young flew extremely well upon leaving the nest for the first time. At least some of them, perhaps all, continued to return to the nest, or the immediate vicinity of the nest, to rest and sleep for at least 3 weeks after fledging. Keith *et al.* (1992) describe *H. angolensis* as a "Solitary nester, occasionally colonial." Given the numbers of pairs nesting within a 15-m radius, and the considerably synchrony of the nesting, I would say that the Ruhizha birds were nesting as a colony. It appears that this species will nest in colonies when a suitable number of nesting sites are available in close proximity. Pairs nesting alone can also be found in the Impenetrable Forest, however. For example, at Kitahurira there is a 10 m long bridge over the Ihizozo River (1500 m a.s.l.). One pair only was nesting under this bridge on 29 July 1991 and one adult with three fledglings were found near the bridge on 1 November 1991. Other adults were not seen.

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Scopus 18: 124–126, December 1994

Received 12 December 1994

Is the Blue Cuckoo Shrike *Coracina azurea* in East Africa?

Keith *et al.* (1992) refer to the Blue Cuckoo Shrike *Coracina azurea* as “truly unmistakable... not only unlike any other cuckoo-shrike but unlike any other forest bird in Africa.” This applies to both sexes when seen well. The sole evidence for this lowland forest species in East Africa is an extralimital site record made sometime in the late 1970s in the Mafuga Forest Reserve (1°03'S, 29°52'E), southwestern Uganda (Britton 1980, Keith *et al.* 1992). Unfortunately, Britton (1980) does not provide any details surrounding this record or give the name of the person who actually made the sighting. The purpose of this note is to question whether *C. azurea* should continue to be listed as an East African species.

C. azurea is a bird of the canopy of primary and secondary lowland forests. In eastern Zaïre it has not been observed above 1190 m a.s.l. (Chapin 1953, Keith *et al.* 1992). Except for the Mafuga Forest sighting, it is not known to range farther east than the Semliki Forest of eastern Zaïre, or to be present in any of the other forests of the Albertine Rift Afromontane Region.

The Mafuga Forest (2000–2500 m a.s.l.) is roughly 100–200 km east of the normal range for *C. azurea*. It is the largest plantation of softwood/exotic trees in Uganda, covering an area of about 40 km². The dominant species are *Pinus patula* and *Cupressus lusitanicus*. *Pinus radiata* and *Eucalyptus* spp. are also present. The only natural vegetation remaining is the secondary forest found in a few of the firebreaks and approximately 1 km² of remnant forest which is variable, patchy in structure, and largely confined to the valley bottoms (Francis & Penford 1991, pers. observ.).

In 1991, Francis and Penford (1991, 1993) spent four days (58 observer hours) surveying the birds of Mafuga Forest. They recorded 85 species but did not see *C. azurea*. It should be noted, however, that they were unable to spend much time in natural vegetation types. Mafuga Forest lies only 4 km from the eastern edge of the Bwindi-Impenetrable Forest National Park (331 km²). These two forests were probably part of a much larger forest block until early this century (Butynski 1984). It is surprising that *C. azurea* would be present in the Mafuga Forest but absent from the nearby Impenetrable Forest with its much greater area and altitudinal range (1400–2600 m a.s.l.), and lower level of habitat disturbance. Dr Jan Kalina and I are familiar with *C. azurea* having observed it in the Ituri Forest, Zaïre. From 1984 through 1993

we undertook thousands of hours of bird research and other field work throughout the Impenetrable Forest without observing *C. azurea*. If this species is in the Impenetrable Forest, the place where it is most likely to occur is in the lowland forest along the lowest reaches of the Ishasha River Gorge in the extreme northern part of the forest.

C. azurea appears to be absent not only from the Impenetrable Forest (Kalina & Butynski in press), but also from other large, lower-lying, reasonably well-studied, forests between Mafuga and the lowland forests of eastern Zaïre. These include the Kibale, Maramagambo and Kalinzu Forests (Friedmann 1966, Friedmann & Williams 1970, Britton 1980, Francis & Penford 1993).

I suggest that *C. azurea* be considered for omission from the East Africa bird list for the following reasons:

1. the one sighting was made at least 15 years ago and has not been substantiated by either a collected bird or additional sight records;
2. Mafuga Forest is unlikely habitat for supporting a population of this species;
3. *C. azurea* is apparently absent from all other Uganda forests even though several of them are larger, closer to *C. azurea* populations in Zaïre, and have habitats far more suitable for this species.

As noted above, the confirmed eastern limit of *C. azurea* is the Semliki Forest of eastern Zaïre. A spur of the Semliki Forest, the Bwamba Forest, extends into Uganda just north of the Rwenzori Mountains. This is the lowest forest in Uganda (740–1000 m) and, as such, is the only locality in East Africa for many bird species. About six species new to East Africa have been found in Bwamba in the past four years (e.g., Ash *et al.* 1991). Bird expeditions to Bwamba should be on the look-out for *C. azurea* as Bwamba is the most likely East Africa forest for this species.

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Scopus 18: 126–128, December 1994

Received 12 December 1994

Hamerkop *Scopus umbretta* on Kilimanjaro

I saw a Hamerkop *Scopus umbretta* at about 18:00 on 5 September 1993 at a muddy stream on the Shira Plateau of Kilimanjaro at an altitude of approximately 3600 m. I can trace no record of the species at a similar altitude; Cordeiro (1994) records it at 2100 m at Londorosi on the western slope of the mountain and I have often seen Hamerkops at 2000 m on the northern slopes. My previous observations relate to a small bog derived from the overflow of a piped water source and both *Xenopus* and *Rana*, presumed prey items, were abundant. The muddy stream on the Shira Plateau also harboured a population of *Rana*.

Reference

CORDEIRO, N.J. 1994. Forest birds on Mt Kilimanjaro, Tanzania. *Scopus* 17: 65–112.

John M. Grimshaw, Kilimanjaro Elephant Project, c/o International School Moshi, Box 733, Moshi, Tanzania

Scopus 18: 128, December 1994

Received 18 May 1994

Lyre-tailed Honeyguide *Melichneutes robustus* and Grey Ground Thrush *Zoothera princei batesi*: new records for Uganda

The Semliki (Bwamba) Forest Reserve (0°52'N, 30°05'E) in western Uganda is separated by the 20-m wide Semliki River from the Ituri Forest of eastern Zaïre. Over 60 per cent of Uganda's forest bird species are found in the Semliki Reserve (Howard 1991) and several new birds for the country have recently been recorded from it (Ash *et al.* 1991). It contains a number of species whose status has given rise to concern, for example Nahan's Francolin *Francolinus nahani* and the Forest Ground Thrush *Zoothera oberlaenderi* (Collar *et al.* 1994). During field work in the Semliki in 1992, I recorded the following two species.

Lyre-tailed Honeyguide *Melichneutes robustus*

Britton (1980) included this species for Uganda, but in square brackets, noting "Although this species has not been positively recorded from Uganda, its unique and unmistakable call has been reported from Bwamba Forest where it can be expected to

occur.” while Fry *et al.* (1988) include southern Uganda (Bwamba and Mabira) in the species’ range, but with no supporting references. D.A. Turner informs me (pers. comm.) that there are no properly documented records of the species from Uganda. I was able to confirm the presence of the Lyre-tailed Honeyguide in the Semliki Forest Reserve: it was heard making its raucous noises over the canopy between 18:40 and 19:15 on 10 and 11 July 1992 and, on the second evening, it called in response to a taped play-back of the species’ call from Chappuis (1985). Four forest guards and Otim Thomas were also present during the observations which took place at a path leading to the Kirima River in UTM square 8195.

Grey Ground Thrush *Zoothera princei batesi*

On 6 July 1992 a Grey Ground Thrush was watched for about 20 s hopping along a path leading to the Kirima River; it then perched on a nearby shrub where it stayed for about 3 min. On 8 July, two specimens of this species were collected from mixed evergreen forest (*Cynometra*-dominated) with dense undergrowth in UTM square 7594. Their identity was kindly confirmed by M. Louette. Mensural data were:

Specimen	body length	mass	wing	tail	tarsus	bill
1	190	67.5	110	73	33	19
2	192	65	112	74	33	18

This species, although mentioned by Britton (1980) in a discussion under the entry for Prigogine’s Ground Thrush *T. kibalensis*, was omitted from the Uganda and East African avifaunas in error. Friedmann & Williams (1973) had already recorded the species for Uganda: their collectors secured two non-breeding specimens (24 June and 5 July) in Budongo Forest and noted that the 1963 Knudsen-Machris Expedition had also “reported” it from Budongo. They go on to say “At that time [1963] this [the Knudsen-Machris bird] was only the second record of this species from Uganda, the earlier one being from Bugoma.” *T. princei batesi* has also been recorded as occurring east to the Ituri Forest (Prigogine 1978). It is interesting that both Britton (1980) and Ash *et al.* (1991) predicted that it would be found in Uganda.

The need for further detailed biological surveys on the status and distribution of birds in the forest cannot be overemphasized.

Acknowledgements

My sincere thanks go to Dr Leon Bennun (National Museums of Kenya), Dr Michel Louette (Musée Royal de l’Afrique Central, Tervuren), Stuart Keith (American Museum of Natural History) and D.A. Turner (Nairobi) for advice. Dr A.D. Johns read the first draft of this note. The work was made possible through a contract with the Uganda Forest Department.

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Scopus 18: 128–130, December 1994

Received 22 February 1993, revised 1 June 1993

The Spur-winged Plover *Vanellus spinosus* in Tanzania

Britton (1980) considered this species to be only a wanderer to Tanzania, south to Morogoro and Rukwa. Urban *et al.* (1986) treated the Rukwa record as extralimital and Hayman *et al.* (1986) show *spinosus* to be a non-breeding visitor to northeastern Tanzania, clearly separated from its breeding range in Kenya. The record for Rukwa is presumably that of Vesey-FitzGerald & Beesley (1960) who listed it as rare but without further details. The reference to Morogoro Region has not yet been traced.

The earliest record I have located is that of Reichenow (1894) who mentioned this species for "Massailand and Victoria-Nyanza". Measurements for eggs are also given but it is not clear if these were from nests found in Tanzania. It is referred to by Fuggles-Couchman (1962) who considered it "Fairly widespread although rather local in Northern and Eastern Provinces either singly or in pairs." Schmidl (1982) gives a sight record for Seronera (Serengeti) of six birds in short grassland on 20 August 1972. An earlier record from Seronera for June 1962 was submitted by N.R. Fuggles-Couchman to the Tanzania atlas project.

In view of these records and its well known residence in the Rift Valley of Kenya (Jackson 1938), it is surprising that earlier authors (Elliott & Fuggles-Couchman (1948), Fuggles-Couchman & Elliott (1946), Morgan-Davies (1964), Thomas (1960) and Beesley (1972)) did not locate it in northern Tanzania during the 1940s to 1960s. Perhaps, being on the southern edge of its range, the population had contracted northwards. Lack *et al.*'s (1980) statement for Tsavo East National Park (Kenya) that it "may be a recent arrival as all WL's [Walther Leuthold's] records are after August 1972 except for 2 in 1971" could reflect a range expansion in the late 1960s.

The Tanzania atlas database now holds 39 more recent records of this species, including two successful breeding attempts. On 12 December 1991 on the eastern shore of Nyumba ya Mungu dam south of Moshi, a partially fledged juvenile with two adults was located among the short vegetation of the upper lake shore [SD]. There were other adults to the south of these birds but no more young were seen [NEB]. Previous records from this locality are for March 1986 [NEB].

On 13 September 1992, a pair with two recently hatched chicks was found on a short-grass plain some 30 km north of Dar es Salaam [NEB]. This seasonally inundated grassland lies immediately behind the sand dunes. It was unusually wet for the time of year but was drying rapidly. A week later it was reduced to a few isolated pools with the adult plovers feeding alongside the water's edge. Previous visits to this locality had been at times of high water (April–May) or during the normally long dry season of June–November. The plovers were therefore exploiting a suitable habitat that would not normally be available during their breeding season. With this degree of adaptability, it is somewhat surprising that the species is as uncommon as it is.

The recent records are given below from north to south and west to east. The Tanzania atlas grid references indicate the relevant quarter degree square.

- 3401A: 1 near Shirati, Tarime District, 15 March 1989 [VB].
3302A: 1 south of Bunda, 29 January 1992 [VB].
3503A: Lake Eyasi, February 1990 and May 1991 [DB].
3503B: Lake Manyara, records for February, March, April, July, August, November and December but no reported evidence of breeding [NEB, LS, DB, PL]. Ngorongoro, January 1984 [GL].
3304A: 2 near Nzega, 6 December 1993 [ES].
3404A: 6 at Lake Kitangiri, 25 September 1991 [ZB].
3506B: near Dodoma, May 1980 and February 1983 [JSSB].
3806D: 3 on Ruvu floodplain, May 1993 [BW].
3807C: area around Lake Tagalala, northeast Selous Game Reserve, records for February, March, May, June, July, August, October and December. A maximum of 7 in February 1991 but no evidence of breeding [BW, LO, NS, NEB, MMW].
3308C: Lugugaa Soda Lake west of Mbeya, 2 birds on 16 July 1985 and the quite remarkable number of "2 dozen pairs" on 15 March 1986 [ES].

Although distinctive, it is often missed by experienced birders from Europe during a 'normal' safari through the northern parks and is therefore likely to exist at low densities even in optimum habitat. It is hoped that this note will prompt others to take an interest in this striking species and that within a year or so we shall have a much clearer understanding of its status in Tanzania.

The following contributors are warmly thanked: E.M. Baker, J.S.S. Beesley, Z. Bhatia, V. Buckwater, D. Bygott, S. Davies, N.R. Fuggles-Couchman, P. Lack, G. Lewis, L. Ommanney, E. Sion, L. Stratton, N. Stronach, B. Whitmore and M.W. Woodcock.

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Scopus 18: 130–132, December 1994

Received 20 March 1994

Request for sightings of *Clarke's Weavers Ploceus golandi*

For three years, from 1989 to 1992, I collected information on the birds of Arabuko-Sokoke Forest, Kenya, including the enigmatic and poorly known Clarke's Weaver *Ploceus golandi*. I am now collating all my observations of Clarke's Weaver and I would be interested to learn of any other unpublished records, especially for the period January to March, when the birds are rarely seen in Arabuko-Sokoke. Please send any details of date, number of birds and other relevant information (for example, if they were seen associating with other species, like helmet shrikes) to me at the following address: John H. Fanshawe, BirdLife International, Wellbrook Court, Girton Road, Cambridge CB3 0NA, England. I will acknowledge all letters.

Notice

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Advances in Raptor Studies welcomes original contributions pertaining to all aspects of biology of birds of prey and owls. Manuscripts will be accepted in English with a complete summary in the author's own language. For further information (instructions to authors, subscription details, etc.) write to The Editor, Giovanni Leonardi, Via Santangelo Fulci 28, 95127 Catania, Italy.

references at the end of a paper or short communication: authors' family names followed by a comma, then initials, each followed by a full point (= full stop, period); **names of journals**: to be given in full; **books**: after author(s), year of publication and title give the town followed by the publisher. Examples:

Ash, J.S. 1993. Changes to the Somalia check-list. *Scopus* 17: 26–31.

Moreau, R.E. 1972. *The Palaearctic–African bird migration systems*. London: Academic Press.

Two copies of contributions, which will be acknowledged, should be typed/printed in double spacing on one side of the paper only, with wide margins all round. Clear hand-written MSS will also be considered. Both English and scientific names of birds should be given when the species is first mentioned, thereafter only one name should be used. The names should be those of a *stated work* and any deviations from this work should be noted and reasons given. Contributions on floppy disk are welcomed, but please still send two hard (= paper) copies.

When you send your contribution on disk, please do not type anything in ALL CAPS unless the combination always occurs in that form (e.g., 'GMT').

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Authors of 'papers' receive three copies of their contribution free of charge. Extra copies, which will be charged at cost, must be ordered when the MS is accepted. Send all contributions to the Editor, G. C. Backhurst, Box 15194, Nairobi, Kenya.

East African Bird Report

This normally forms the third issue of *Scopus* each year. Records from Kenya, Uganda and Tanzania are welcomed. Please send them as soon as you can to D. A. Turner, Box 48019, Nairobi.

Records of rare birds are assessed by the internationally-based East African Rarities Committee. If you see a rare bird, it may help to telephone one of the OSC members so that someone else can see the bird.

Ringling scheme of eastern Africa

This covers several countries in the area. Qualified and aspiring ringers should contact the ringling organizer, Box 15194, Nairobi for more information.

E.A.N.H.S. Nest Record Scheme

Details of most kinds of breeding activity are required by the scheme. Nest record cards may be obtained free of charge from the organizer, Dr Leon A. Bennun, Department of Ornithology, National Museums of Kenya, Box 40658, Nairobi.

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